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THE Rh CONSTITUENT OF THE HUMAN RED BLOOD CELL

A PRELIMINARY REPORT

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RECENT WORK IN AMERICA AND ENGLAND

The Rh constituent (named after *Macacus rhesus*, the common brown monkey of India, in the R.B.C. of which it is constantly present) of the human R.B.C. has been found to be present in 85 per cent and absent in 15 per cent of the white American population (LEVINE, 1942). Whether the absence is absolute or relative has not been made clear in the original report on the procedure of testing the R.B.C. (LANDSTEINER, WIENER, 1941). Later workers have so adjusted the dilution of the testing sera as to obtain 85 per cent positive and 15 per cent negative results with the R.B.C. of an unselected white population (GALLAGHER & JONES, 1943). Absorption of the sera, giving these figures in the selected dilutions, with negative R.B.C. has made further results sharper, suggesting an absolute absence. Random samples of blood from donors tested with several human anti-Rh sera have given similar results (BOORMAN, DODD & MOLLISON, 1942).

The Rh positive fœtus of an Rh negative mother (inheriting the character from an Rh positive father) iso-immunises the mother and thus suffers from fœtal erythroblastosis in its various forms. For the iso-immunisation to occur the absence of the constituent in the mother must be absolute.

Incidentally, the Rh constituent is a *substance* physically, an *antigen* immunologically and a *character* genetically. There is no need to call it a *factor*, loosely.

THE WRITERS' PLAN

The writers' plan includes (*i*) testing of human R.B.C. (obtained from the Red Cross Blood Bank) as a routine and (*ii*) testing of human R.B.C. of husband and wife with a suggestive history.

The testing sera are (*i*) anti-Rh rabbit serum, (*ii*) anti-Rh guineapig serum, (*iii*) anti-Rh fowl serum and (*iv*) serum of mothers who have given birth to children suffering from fœtal erythroblastosis.

The R.B.C. are 48 hours old but in a good state of preservation. Routinely they are collected from the Blood Bank when 24 hours old, washed and stored at ice box temperature overnight. That is the only way of obtaining regular supplies for fairly big batches, once a week. The R.B.C. of parents with a history, from hospital, are also stored for 48 hours (for sake of uniformity). The satisfactory serum so far obtained has been the rabbit serum only.

DETAILS OF ANTI-Rh RABBIT SERUM

Two rabbits were injected intravenously with 1 c.c. of 50 per cent washed R.B.C. of *Macacus rhesus*, thrice, after an interval of one week. Ten days after the third injection a sample of serum (taken from the ear vein) from one of them was found to lyse two per cent *Macacus rhesus* R.B.C. almost immediately. The rabbit was bled from the heart. The active serum diluted with fresh normal rabbit serum lysed the 2 per cent R.B.C. suspension in a dilution of 1 in 300. The same serum when inactivated, agglutinated the same suspension in a dilution of 1 in 300 in normal saline, in one hour.

For testing the human R.B.C. two dilutions of the inactivated serum were selected, after trial and error: (*i*) 1 in 10 and (*ii*) 1 in 25. These dilutions were put up with 2 per cent suspension of R.B.C.

THE TECHNIQUE OF HAEMAGGLUTINATION

The technique is based on the one described previously for grouping and typing blood (GREVAL, CHANDRA & WOODHEAD 1939 & 1941) with the addition of an R.B.C. control for each blood tested.

A slide is divided on the obverse by glass marking pencil into three compartments. On the reverse is inscribed from

below, along the lower margin, the distinguishing number. The compartment on the worker's left is for the strong serum dilution, the next (in the middle) for the weak serum dilution and the next (on the worker's right) for saline only.

The volumes are measured by calibrated pipettes (one finger pipette for each 2 per cent R.B.C. suspension and one teat pipette for the saline, the weak serum dilution and the strong serum dilution, in this order).

The equal volume of R.B.C. suspensions and serum dilutions or saline are mixed with the rounded ends of short glass rods, moving clockwise and then counter-clockwise the same number of times.

The slides are kept in a moist chamber made from Petri dishes, enclosing wet filter paper in watch glasses, all the time. The fluid is moved and agitated by tilting and untilting the dish with a clockwise and then counter-clockwise rotatory motion. Occasionally, a side to side jerk is also imparted. Incipient agglutination is detected with the aid of a hand lens. A mere sedimentation of the R.B.C. is at once differentiated from the agglutination by the cells rising from the slide, producing the appearance of a thin cloud dispersing before a gentle breeze and forming patterns before going into a homogeneous suspension again.

The preparations in the moist chamber (four slides in one chamber) resist drying for over 24 hours. The slides are never removed for manipulation or inspection. Herein lies the superiority of the slide method over the tube method, specially when preparation of a slide from a tube is recommended for final reading. Further, it provides a standard grade of strong hæmagglutination, centrifugal clumps, designated + +.

Absence of hæmagglutination or even of granularity with the 1 in 25 serum dilution is read as negative.

A granularity in the R.B.C. control rejects the specimen. This control is put up in view of the fact that the R.B.C. are not quite fresh. Only two specimens were rejected in over 200 bloods.

Observations are made every 15 minutes for one hour.

The Results and Conclusions

The accompanying table gives the details of the intensity of the hæmagglutination when present. The following conclusions emerge:

1. The Rh negative rate is 10 per cent.
2. The details of the grades of the reaction are suggestive of a quantitative rather than a qualitative difference. With the selected dilutions of the testing serum the substance was present in abundance in 3 subjects only (1·5 per cent) and absent from 2 only (1 per cent). The general distribution was of this order: Positive, more than ¾ and of the rest—less than ¼—doubtful and negative in about the same proportion.
3. No special relationship to 0, A and B existed.
4. The negative percentage was remarkably like the frequency of N in Calcutta Indians (M 42·7, N 10·7, MN 46·7, in percentages in 200 Indians: Greval, Chandra & Woodhead, 1939). But when the negative cases in the 2nd half of the series were tested with anti-M and anti-N fluids they fell into all these types.
5. In the absence of an experience of the reactions with anti-Rh human serum, from iso-immunised Rh negative mothers, which may give more clear-cut reactions, evidence in favour of an absolute presence or absence of a new antigen like A and B or even M and N cannot be held to be striking or even convincing inferentially. To err on the right side, however, it must be recommended that in selecting donors for obstetrical cases (*i*) direct matching of bloods should never be omitted and (*ii*) observation of hæmagglutination should be extended to one hour.

A Table of Results of Test for Rh Substance in 200 Indians in Calcutta.

Batches according to categories of reactions.			*Hæmagglutination in 1 hr. with different dilutions of an anti-Rh rabbit serum.* 1 in 10	1 in 25
Strongly positive	43	3	++	++
		40	++	+
Positive	120		+	+
Doubtful	17	15	+	±
		2	±	±
Negative	20	13	+	−
		5	±	−
		2	−	−

Total 200 = Positive 163 + doubtful 17 + negative 20.
= Negative 20 + other than negative 180.

++ = Centrifugal clumps, including at times centripetal clumps also.

\+ = Centripetal clumps only.

± = Granularity discernible at rest and on slight movement but disappearing on strong agitation, to reappear at rest. Such granularity with isonins (isohæmagglutinins) occurs under exceptional circumstances only.

− = Homogeneous suspension of R.B.C.

Summary

1. A preliminary report on the Rh constituent in Calcutta Indians is presented: Rh + 90 per cent and Rh − 10 per cent.

2. The testing serum was prepared from a rabbit. Its preparation and titre are given.

3. The details of the intensity of the reaction are suggestive of a quantitative rather than a qualitative difference which is unlike that between 0, A, B and AB or even M, N and MN.

4. Until sharper and qualitatively different reactions are obtained, with possibly iso-immune serum, the evidence in favour of an absolute presence or absence of a new antigen cannot be said to be convincing.

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SIGNIFICANCE OF BLOOD PROTHROMBIN VALUE IN DISEASES OF THE BILIARY TRACT*

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Introduction

Both for assessing the function of the liver and for evaluating the hæmorrhagic tendency of a patient, determination of the prothrombin content of blood is important. The prothrombin level of blood is maintained at the physiological level on adequate intake and absorption of vitamin K in food, and on proper utilisation of this substance by the liver to elaborate prothrombin. That liver plays a vital role in the production of prothrombin has been shown by liver extirpation studies (Andrus *et al*, 1939) and by experimental studies in white rats exposed to known hepatotoxic agents (Bollman *et al*, 1940).

When the detoxifying capacity of the liver is impaired or overtaxed, the body as a whole suffers from the resulting toxæmia. The knowledge of the deficient function of the liver in such and other conditions is of special interest to the surgeons who are frequently to evaluate an ill patient as a surgical risk.

Reid (1941) investigated cases of cirrhosis of the liver and found that the amount of prothrombin in blood was always reduced and there was very little response to parenteral administration of vitamin K preparations. While in cases where there was no liver damage, *e.g.*, carcinoma of the head of the pancreas, the prothrombin level of blood returned to normal after administration of the drug.

Illingworth (1939) showed that the cause of hæmorrhage which occurred after some days of operation for biliary tract disease was due to low prothrombin concentration of blood. This hæmorrhage could be effectively checked by vitamin K administration.

Kark and Souter (1941) studied a group of patients with hypoprothrombinæmia. These patients suffered from affection of the biliary tract such as stenosis of the bile duct, cholecystitis, carcinoma of the ampulla of Vater, or cholelithiasis. These patients were treated parenterally with synthetic vitamin K. In most of them the lowered level of prothrombin rapidly returned to normal on the administration of the vitamin.

Experimental Method

Prothrombin content of blood has been expressed as prothrombin index per cent. From the prothrombin time the prothrombin index per cent is determined as $\frac{\text{normal prothrombin time}}{\text{unknown prothrombin time}} \times 100$. The prothrombin time was estimated by one stage method of Quick. Prothrombin index per cent between 90 and 110 has been taken as normal. In some cases this was determined by the watch glass method of Innes and Davidson, but this was abandoned as the endpoint is not very sharp. This test, however, has certain advantages, *viz.*, that it can be carried out with only a few drops of blood (*cf.* 4·5 c.c. in Quick's method) by the bed side of the patient in a couple of minutes.

Hippuric acid liver function test has also been expressed in terms of percentage. This is calculated from the amount of hippuric acid (in gms.) excreted in urine after ingestion of 6 grams of sodium benzoate. For this calculation 5 grams have been taken as 100 per cent. Ninety per cent is the lower limit of the normal figure.

Observations

The author has studied cases of biliary tract diseases, such as cholecystitis, cholelithiasis, and carcinoma of the head of the pancreas. Prothrombin level of blood was determined in all the cases and hippuric acid liver efficiency test was studied in some of them. Special attention was given to find out any relationship between the duration and degree of jaundice and prothrombin level of the blood, and also on the hippuric acid liver function test.

Table Showing Prothrombin Index per cent and Hippuric Acid Excretion per cent in Biliary Tract Diseases

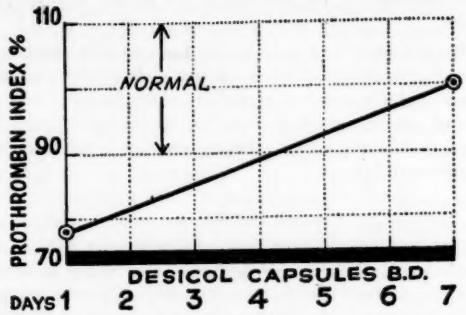
Case No.	Clinical diagnosis	Jaundice: Duration in week	Jaundice: Degree	Prothrombin Index per cent	Hippuric acid excretion %
1.	Cholelithiasis ..	12	+++	71	90
2.	Cholecystitis ..	4	++	90	..
3.	Cholelithiasis ..	2	+	78	88·2
4.	Carcinoma head of pancreas ..	32	+++	83	..
5.	Cholecystitis ..	1	++	83	86·2
6.	Cholecystitis ..	27	+	83	95·2
7.	Cholecystitis ..	1	+	100	92·2
8.	Cholelithiasis ..	15	+	100	..
9.	Cholecystitis ..	1	+	76	90·4
10.	Cholecystitis ..	½	+	81	..
11.	Cholelithiasis and amœbic hepatitis	1½	++	68	..
12.	Cholelithiasis ..	16	+++	63	70
13.	Cholelithiasis ..	2	+	96	..
14.	Cholelithiasis ..	..	..	86	..

It will be noticed that no definite relationship could be found betwen the degree or duration of jaundice and the prothrombin level of the blood or with the hippuric acid excretion per cent. In 14 cases of biliary passage affection, 10 had hypoprothrombinæmia, and 3 out of 7 cases had deficient hippuric acid excretion. It will be noticed that the deviation of the prothrombin level of blood was more pronounced than the hippuric acid excretion.

This fact could be explained if we consider that absorption of vitamin K from the intestine is inadequate due to deficient amount of bile reaching the lumen of the gut in these conditions, while hippuric acid excretion (which depends upon absorption of sodium benzoate and does not require bile salts) has not been much affected.

The effect of bile salts and vitamin K on the prothrombin level of the blood was studied in cases of biliary tract affections (*vide* Graphs I and II).

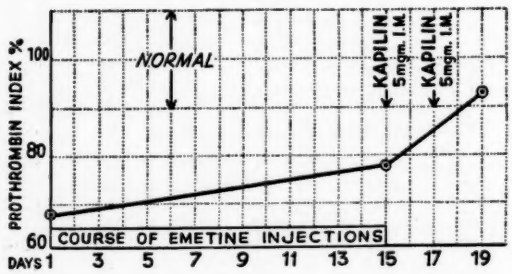
* Read at the Scientific Section of the XIX All-India Medical Conference, Patna, April 1943.



GRAPH I—SHOWING THE EFFECT OF BILE SALTS ON THE PROTHROMBIN LEVEL OF BLOOD IN A CASE OF CHOLELITHIASIS.

It will be seen that the prothrombin level of blood came to normal with the administration of bile salt (Desicol) even when no vitamin K preparation was given.

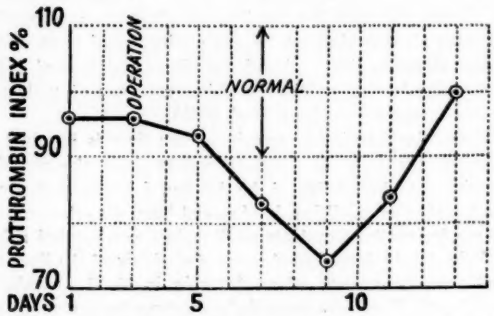
The administration of bile salts led to the absorption of vitamin K of food.



GRAPH II—SHOWING THE EFFECT OF SYNTHETIC VITAMIN K (KAPILIN) ON BLOOD PROTHROMBIN LEVEL IN A CASE OF CHOLELITHIASIS WHO HAD ALSO AMOEBIC HEPATITIS.

It will be noticed that the curve of prothrombin level in Graph II rose gradually after a course of emetine and on administration of Kapilin, the curve showed further steep rise. It is interesting to note the two rises in the curve, one following emetine and the other following Kapilin. The first rise in the curve could be explained on the basis of better liver function as a result of improvement in the condition of the liver following emetine injections and the rise after Kapilin injections was due to adequate supply of vitamin K to the liver to manufacture prothrombin.

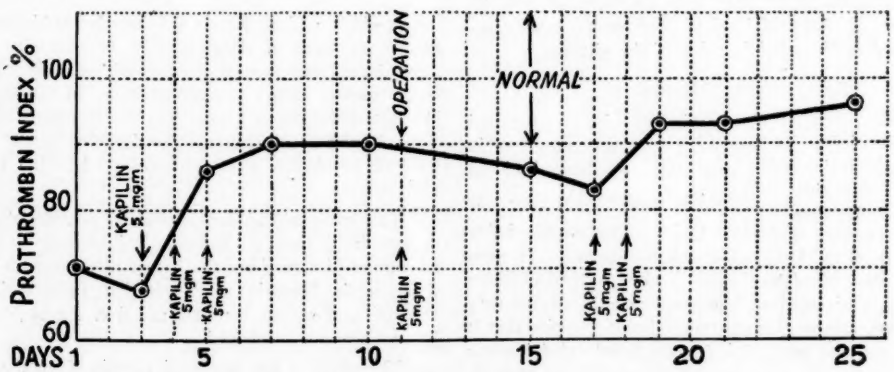
The prothrombin level of the blood was determined on different days in cases who underwent operation for gall stones (cholecystectomy).



GRAPH III—SHOWING PROTHROMBIN LEVEL BEFORE AND AFTER CHOLECYSTECTOMY.

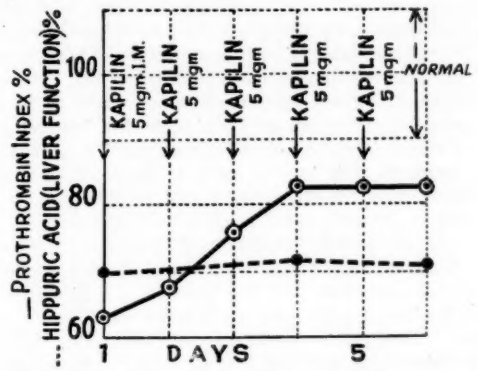
It will be seen that the level of prothrombin was within normal limits before operation, but after operation the prothrombin index per cent went down to 74 on the 7th day of the operation, but rose gradually to the normal figure in the next four following days.

This could be explained by the fact that during the first few days the patient did not receive vitamin K in his post-operative diet (diet being deficient in green vegetables) and also because very little bile reached the intestines as the common bile duct was drained outside through a tube.



GRAPH IV—SHOWING PROTHROMBIN LEVEL BEFORE AND AFTER SYNTHETIC VITAMIN K (KAPILIN) INJECTION IN A CASE OF CHOLELITHIASIS WHO UNDERWENT CHOLECYSTECTOMY.

The initial deficiency in the prothrombin content in this case (*vide* Graph IV) was the result of non-absorption of vitamin K from the intestine due to very little bile or no bile reaching the intestine. This was restored to normal after Kapilin injections. The cause of the second fall during the first few days of the post-operative period could be explained on the same basis as in the previous case, *viz.*, the vitamin free post-operative diet and the artificial biliary fistula made during the operation. The fall of blood prothrombin level in this case was only 7 per cent, while in the previous case who was not given vitamin K the post-operative fall was 22 per cent.



GRAPH V—SHOWING THE EFFECT OF SYNTHETIC VITAMIN K (KAPILIN) IN BLOOD PROTHROMBIN LEVEL AND HIPPURIC ACID LIVER FUNCTION TEST IN A CASE OF CHOLECYSTITIS.

From Graph V it will be noticed that after the injection of synthetic vitamin K (Kapilin) there was a rise in the prothrombin level for the first three days, after which there was no further rise. The prothrombin level did not reach within normal limits. The hippuric acid liver function test was 70% in the beginning and at the end of the week there was very little difference. In the beginning the blood prothrombin index per cent was lower than the hippuric acid excretion percentage but after administration of Kapilin, the blood prothrombin index per cent was higher than the hippuric acid excretion percentage.

Thus the synthetic vitamin K had an effect only on the prothrombin level of the blood and none on the hippuric acid excretion.

The rise of the blood prothrombin in the beginning after vitamin K administration could be explained by the fact that the vitamin was not adequately absorbed from the intestines due to the diminished bile in the intestine as the patient was suffering from obstructive jaundice, but on perenteral administration of sufficient quantity of vitamin K, it was available to the liver to manufacture prothrombin. The normal level could not be reached and this could be explained on the hypothesis that the liver function was also defective in this case, as was shown by the hippuric acid liver function test (70%).

It will further be noticed that after sufficient vitamin K was available to the liver for the manufacture of prothrombin, the prothrombin index did not rise beyond 83%. There was practically no change in the hippuric acid percentage after the vitamin therapy. Thus both the experiments show that the liver was damaged to some extent.

DISCUSSION

From the above it will be seen that there are two types of hypoprothrombinæmia in the production of which different pathological factors are concerned. These are: (1) Deficiency hypoprothrombinæmia in which the prothrombin level of blood is restored to normal on administration of bile salts or injections of vitamin K. In such cases there was no appreciable fall of hippuric acid excretion. (2) Cellular atrophy hypoprothrombinæmia, in which the prothrombin level could not be restored to normal on administration of vitamin K as the liver cells were damaged due to dilatation of the biliary channels resulting from back pressure consequent on obstruction in the biliary passages.

The practical application of these facts regarding the above two types of hypoprothrombinæmia, is very important. The occurrence of cholæmia as complication after operation on biliary passages is disastrous and the surgeon will be in a happier position if by any means he could anticipate it and thus take measures to avoid it. Prothrombin index per cent will give a fair idea of the hypoprothrombinæmia present in such cases. Administration of bile salts or vitamin K will further differentiate the two components of this hypoprothrombinæmia. The 'deficiency' part will respond to this therapy and only the 'cellular atrophy' part will persist. If this 'cellular atrophy' part is very marked then the surgeon has to avoid all measures which will further damage the liver cells (*viz.*, choloroform anæsthesia, prolonged operation of cholecystectomy, etc.) and his aim should be to gradually decompress the intrahepatic biliary passages by 'therapeutic biliary fistula'. The liver, due to its remarkable power of regeneration, will in due course recover to an extent to permit a radical measure to be taken later on. To combat the 'deficiency' part following upon this decompression operation, bile salts should also be introduced into the gut by mouth to facilitate the absorption of vitamin K as mere administration of bile (collected from biliary tract drainage tube) per rectum is not enough, as this does not reach high up in the small intestine to aid the absorption of vitamin K. By bile enema, the bile salts are supplied quite all right but vitamin K absorption is not at all helped. For the latter to take place bile salts should be present in the small intestine. If the administration of bile salts by mouth is contra-indicated or not desired, vitamin K may be given parenterally with equally good results.

SUMMARY

1. The cause of hæmorrhage in biliary tract disease is due to low prothrombin concentration of the blood, and as the degree or duration of jaundice is no criterion of the degree of hypoprothrombinæmia it is important in such cases to know the prothrombin content of blood.

2. The hypoprothrombinæmia has been shown to be due to two factors: (*a*) Deficiency in absorption of vitamin K—this can be made up easily either by administration of bile salts or administration of vitamin K; (*b*) damage of the liver cells caused by pressure of the dilated intrahepatic biliary channels—the hypoprothrombinæmia due to this factor is not made up by administration of bile salts or vitamin K.

(*Continued on page 91*)

PROBLEM OF LATE, QUIESCENT AND LATENT SYPHILIS

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(*Continued from previous issue*)

HEREDO-LATENCY: FAMILIAL LATENCY

Parents suffering from acquired (early), late or latent syphilis or heredosyphilis may beget offsprings with or without heredosyphilitic stigmata but who sooner or later give evidences of latent syphilis. Fœtal syphilis may result in miscarriages, still-births, premature births, neonatal or infantile deaths, an inaptitude for life with low expectations of life and in those who outlive these, congenital, heredoneonatal or familial syphilis with one or more of the classical stigmata; distinctions have been made in the nomenclature but we shall content ourselves with an inclusive designation of 'heredosyphilis' and in suitably suggestive occasions 'familial syphilis'. As, however, we are concerned with latency and lateness, we shall deal with conditions of familial or heredolatency, meaning those in which latency is the predominating feature. The point of interest is in those cases in which the element of latency is manifest in the offspring of syphilitic parents who themselves are latent syphilitics which in other words mean transmission of heredolatency. Heredolatency may, however, be the initial feature in such children whatever the character of parental source may be. It is a further interesting observation that syphilitic mothers may have the protection of pregnancy as regards clinical evidences, her S.W.R. being positive, particularly in young mothers because of the activity of the spirochæte and the shorter duration. Such mothers are naturally more frequently pregnant as there are shorter durations of pregnancy due to miscarriages. The fathers not being so protected are more likely to provide clinical evidences. It is also our observation that a number of syphilitic fathers without clinical evidences, exhibit latency by developing neurosyphiltic symptoms at 35 to 45 years age and may thus be active agents of heredolatency to their offspring arriving before this age, that is, during the period of quiescence giving rise to difficulties in diagnosis. In other cases, clinically and serologically negative parents get children who develop latency in later age and in whom the stigmata may have been overlooked or otherwise ignored due to social or other considerations. These are cases of heredolatency and if it is a case of familial latency in which parents of high social position are concerned, it enjoins considerable professional tact and delicacy in communicating the diagnosis. In one case which I refrain from reporting, I was in my younger days in the unfortunate position of being threatened with legal proceedings till a physician of equally high position as the party, intervened as a mediator and I had the honour of prescribing the treatment. It has been a joy to see the whole family rescued from a mass attack of familial syphilis.

There is no dearth of cases of heredolatency in our clinical experience and in the literature; the following cases of three-generation transmission have some interesting features.

Case Reports 2-6—M=male. F=female. A.M. & A.F.=parents. A.M.'s parents' history not available. A.F.'s father died suddenly; reported to have had ulcers and suggested that these were syphilitic. A.M. died young; no history of acquired syphilis.

A.F. 60, widowed 12 years. Was healthy all her life but developed neuritis and general health began to suffer when she was about 40. Consulted 1938. Complaints: Pain left shoulder and arm, sore throat. Examination: Left brachial neuritis, mucous patches and ulcers, faucial and oronasal. Reflexes irregular. S.W.R. negative; moderate lymphocytosis and eosinophilia: salicylates, analgesics, physiotherapy, diathermy and short-wave inductothermy, etc., gave some relief but increasing doses of iodides gave more permanent relief. The party returned to their up-country home. Objected to anti-syphilitic treatment as she thought her husband never suffered from 'objectionable' diseases. Throat condition improved with local medication. Returned three years later (1941) with right brachial neuritis and oronasal ulcers; general health much reduced and willingly submitted to antisyphilitic treatment. Full courses of arsenic and bismuth injections in addition to previous methods of treatment. This gave her prompt relief of pain in the shoulder and improvement in other conditions.

Family history—Belongs to a respectable family of high social and commercial position. Proprietors of several cotton, sugar and jute mills. A.F.'s mother had several issues but only she and a brother lived up to adult age. A.F. had 8 issues B.1 to B.8 (M. & F.). B.1.F. living (report follows), B.2, B.3 miscarriages, B.4, B.5 died in infancy (1-3 months) from stomach and liver complaints with jaundice. B.6.F. died 10 years old from meningitis. B.7. M. living, healthy. B.8.M. no history of acquired infection; cutaneous and mucous ulcers, D.G.I. (dark ground illumination) treponema positive, S.W.R. negative, Kahn positive. Complaints: physical and mental weakness, lack of energy and concentration. Wife had three pregnancies one resulted in miscarriage and two died in infancy (undiagnosed).

Case F.1.F. married, husband has glycosuria; no history of acquired syphilis. No miscarriages, 5 issues C.M.1, C.M.2, C.M.3, C.F.4, C.F.5.

Case C.F.4, age 18. Married, no issue, husband uses contraceptives being cautioned against familial transmission through mother. Complaints: losing weight. Mucous patches and ulcers oronasal. Right ear deafness—examination disclosed ulcerating papilloma on meatal wall: electro-surgical desiccation revealed drum intact. Left ear drum: perforation, ulcers and discharge. Ulcers on inferior turbinates, chronic nasal catarrh. S.W.R. positive, Kahn negative. Lymphocytosis. Two courses of arsenic and bismuth. General improvement, weight increased, ulcers healed (local medication was adopted during course). S.W.R. reduced negative.

Case C.F.5, age 8. Stigmata, saddle nose, high arched palate, faucial mucous patches and ulcers, snuffles. Pain in ankles, on examination marked pes planus; putting on weight unaccountably. S.W.R. positive.

Lymphocyte count high. Bismuth injections relieved ankle pain. Orthopœdic treatment and appliances. Physiotherapy, calcium, etc. Two courses of bismuth followed by arsenic. Pain relieved. Walks better, ulcers healed. Weight stationary. Child much agile and took to games and sports.

The record of these cases show familial transmission through three generations.

The following series of cases illustrate some other aspects of latent familial syphilis.

Case Reports 7-15—Parents A.M. (male) and A.F. (female), the next generation B.1 to B.8 and the third generation C.1 to C.12 (M. & F.).

A.M. A person of high intellectual attainments and a scholar of international fame. Infected while abroad aout 25 years ago. Treated there with pills, inunctions, iodides and at various spas; pronounced cured. Consults me about 25 years after infection and supposed cure. Examination: characteristic fatigue syndrome of latency, raised blood pressure. S.W.R. positive, C.S.F. doubtful. Heavy mental work. Could not stand the strain, tired and exhausted feeling and sustained mental strain was not possible. Prescribed enforced physical and mental rest. Two courses each of arsenic and bismuth injections; hydrag and iodides alternated. Later entodon injections; considerably improved; got back to his intellectual persuits and 'high life'. Cardiovascular symptoms developed. Sudden and unexpected death during a 'heart attack'.

A.F. Early years of her married life fairly uneventful. Later recurring hæmoptysis which was suspected to be of tubercular origin but repeated negative laboratory tests; these stopped with calcium and iodide therapy. Then optic neuritis developed resulting in practically total blindness. Later, nephritic symptoms and hepatitis. An invalid in bed for some time and death came from symptoms of renal failure. Seven issues, no miscarriages.

B.1.M. University scholar graduating abroad with distinctions in literature and law. Good health up to middle age only trouble being defective eye-sight. Developed choroido-retinitis, treated here and abroad, but it became progressively worse, now practically no vision. Four issues C.1.F, C.2.F fairly good health, males C.3.M, C.4.M. marked features are physical and mental weakness. Mentally under-developed; otherwise precocious.

B.2.M. A weakling; mental subnormality, neurotic. Wife got neuropsychotic. Two issues. C.5.M physically well developed but intellectually poor; could not go to school, study affected health. C.6. F much like her father, mental symptoms, want of control and excitable.

B.3.M. Remarkably good physically and mentally. Good academic career, held high appointments. Two issues C.7.F. and C.8. M.—both weaklings, chronic hepatic insufficiency but fairly intelligent much less so than parents.

B.4.M. Good mentally and physically. University and military education and career quite good. No issue.

B.5.F. Eye-sight defective (organic). One issue, healthy.

B.6.F. Practically blind, retinitis. One issue fairly healthy.

B.7.F. Healthy, two issues—healthy.

Remarks—These two series have some interesting features. In the former it is female transmission which passes through three generations in which there is one apparent escape. In one case S.W.R. is negative while D.G.I. is positive. The lesions are mainly mucocutaneous, others being peripheral neuritis, meningovascular and dystrophic. There is a marked inaptitude for life with a series of miscarriages and infantile deaths.

In the second series there is a male transmission passing through two generations, the lesions being characterised by involvement of the nervous system, special senses (ocular), cardiovascular and visceral (pulmonary, hepatic, renal). Mental feebleness is well marked. There is a possibility of the offspring being inclined to be oversexed. There were no miscarriages which was so marked in the first series. The weaklings show some indications of inaptitude for life. The second series show some good escapes, but the next generation picks it up.

Regional Manifestations in Latent Syphilis

We shall now consider briefly the characteristic modes of involvement and regional manifestations after a period of syphilitic quiescence or latency.

The Skin and Mucous Membrane: Lesions of the skin and mucous membranes and mucocutaneous regions may be diagnostic clues for late, latent and quiescent syphilis. The solitary lesion such as a subcutaneous or submucous gumma, otherwise called nodular or nodulo-ulcerative syphiloma have the invasive and necrotic or destructive tendencies and may involve adjacent skeletal structures such as the periosteum, bone and cartilage. Histologically, in their earlier stages the diffuse round-cell infiltration give them a superficial resemblance to sarcomata whereas, in later stages, after further pathological changes they resemble tuberculoma. Tissue necrosis results in indolent ulcers not amenable to surgical treatment or therapeutic measures other than those for syphilis. Ineffective reparative attempts produce thin atrophic scars with central and peripheral depigmentation and pigmentation. These characteristic clinical and histological phenomena are looked for in cases of late and latent syphilis. The superficial lesions are pigmentary residues of syphilides in which the aggressive pathological processes being arrested, there is fibrosis with fine cicatrization resulting in macular, non-contractile scars with areas of central depigmentation and peripheral pigmentation. Being in intersecting whorls they are polycyclic in outline aptly described as *syphilitic leukomelanodermia*. In the non-pigmented races, it is characterised by the depigmented areas being of a lighter shade than the individual's complexion. It is also an interesting experience that while other lesions respond to syphilotherapy these pigmentary residues persist more or less indefinitely, even after negative serologic tests, a matter of much social concern for the patient. I shall here cite two illustrative cases.

Case Report 16—At an official interview, I found the officer with his left foot propped up, groaning at the least movement. He said he had these two painful sores for months on his leg which his doctors could not cure.

I persuaded him to remove the dressing of lint and adhesive plaster and I found unhealing ulcers with membranous surface and peripheral skin pigmentation. On careful questioning, I obtained a history of a genital sore following an exposure which he said healed readily. On close examination, there was the remains of an induration on the corona. He thought he was cured as he had a full course of hydrarg and iodines, while in England, and had a spa treatment as well. (These were, of course, pre-salvarsan days).

Two injections of arsenobenzol rendered the ulcer clean and painless and two more healed it up leaving a typical pigmented-depigmented cicatricial area. He thought he was cured again and would not be induced to take further injections, particularly as he was under orders of transfer to a hill station as a touring officer involving much riding and he thought that the gluteal injections would interfere with his duties. Several years later, he consulted again for desquamation at the site of the primary lesion and a leukoplakial patch on his glans penis. N.A.B. was in use then but he would not undergo injections of this or even of bismuth. He was, however, induced to take hydrarg and iodides and local applications, though I doubt he ever took this treatment regularly. A few years later, I was summoned by telegram to a hill station to see him as he was desperately ill. What I found was a case of cardiovascular syphilis (arteriosclerosis and aortitis with much decompensation) and marked psychopathia. I found a well-equipped cellar and I was told he had lately been free with his alcoholic beverages. His end came within two weeks in spite of all endeavours. Fortunately, he was single and has not left behind 'probables' of heredosyphilitics.

Case Report 17—The second case is of a senior army officer with whom I was travelling on military duty on a long and arduous journey. He was still single and the question of 'settling down' somehow cropped up on which he exposed an ankle with leukomelanodermic patches which had been persisting for years in spite of treatment, signifying that ideas of matrimony could not be entertained as he would not consider himself free from infection till these clared up even if his serological tests were negative.

Psoriasis, particularly of the palmar and plantar regions have the typical scales and marginal pigmentations as well as a nodular element due to hyperlapsia and keratosis; by these characteristics, palmar and plantar keratodermia of parasitic, occupational and other origins can be differentiated. The hyperplastic types give the parts warty or horny appearance which used to be called syphilitic warts or corns (lues cornee).

Case Report 18—A married lady had separated from her husband as she discovered that he had sometime or other contracted syphilis. The husband had three relapses during treatment but eventually (after some years) being certified cured, they were re-united. Some time later, the wife consulted for headache and backache. On examination a couple of corns were dectected on her palm; S.W.R. negative but C.S. fluid suggestive. Husband on examination: scrotal psoriasis, S.W.R. negative. In this case of conjugal latent syphilis S.W.R. was consistently negative in both and C.S.F. positive in the wife.

Case Report 19—Indian commercial magnate of the Punjab, single, consulted for what was diagnosed for him by local doctors as gleet. History of exposures, some remote, others recent none of which were followed by classical signs of gonorrhœa; the little discharge had evaded all treatments of urethritis. Local examination: some rather avascular buds, millet seed type of granulations in anterior urethra. General: small ulcer with raised keratodermic pigmented margins on soles of feet (Reports he had several operations for corns and bunions like these, recurred and never healed completely). Sensory disturbance (paræsthesia) with irregular reflexes, lower limbs. Tests: S.W.R. and Kahn positive. Diagnosis: intra-urethral chancre, missed early syphilis, latency. Treatment: commencing hydrarg and iodides and cauterisation urethral lesions, then bismuth, later arsenic; physiotherapy. Result: discharge ceased, foot ulcers healed and nerve symptoms improved. Took a very long course.

In this country parasitic dermatoses are liable to complicate diagnosis but an undercurrent treponemal agency should not be overlooked. *Leprosy and tropical granulomata occasionally have a syphilitic resemblance* and as 30 per cent of leprosy cases have positive S.W.R. it further confuses the diagnosis unless aspirated serum shows the acid-fast bacilli.

Case Report 20—A science student consulted his young medical friend for patches of scaly psoriasis on his arms which he diagnosed to be of heredosyphilitic origin. He gave him courses of N.A.B. and bismuth injections and as the results were indifferent, asked my advice. Organotherapy, calcium and vitamins combined with heliotherapy completely cured the condition. His S.W.R. was doubtful but became negative and remained so.

Case Report 21—A young practitioner consulted me for what he thought to be a case of macular syphilides with positive S.W.R. which was very resistant to N.A.B. and bismuth. As the lesions looked suspicious, I snipped a piece off a nodule and found typical acid-fast bacilli.

The hair and nails may often be apparent sites of late syphilitic affection. *Patchy alopecia* of the moth-eaten type tailing off into healthier parts of the scalp is characteristic and it is worth while paying attention to the eyebrows of women for small thinning areas. *Syphilitic onychia* and *paronychia* have to be differentiated from those of parasitic and tubercular origins. Marginal pigmentation, resistance to local treatment, serum and therapeutic tests are our guides.

Case Report 22—A young lady, recently married, consulted me with her family physician for leukoderma and brittle nails. Examination: patches of psoriasis and leukomelanodermia, onychia and paronychia.

Family history: paternal acquired infection; no apparent evidence till she was 18, a few months before she got married. A case of latent heredosyphilis. Had

about two years of non-specific treatment without any relief. Arsenotherapy had almost immediate effect on the nails, making them clean and restoring the normal smoothness. Six months' steady treatment cleared up all the other but three toe nails, which were the worst, required further treatment. Psoriasis cleared up but pigmentation was slow in clearing. Bismuth injections had further beneficial effect on the three remaining nails and the skin patches became even smoother.

Mucocutaneous areas are also affected with *pigmented hypertrophic nodular syphilides* which may ulcerate and cicatrize. The eyelids, anterior nares, lips, anus and vulvo-vaginal regions are the usual sites. The palpebral lesions may be mistaken for parasitic infections.

Mucous membranes suffer similarly from hyperplastic changes; the commonest conditions which are liable to be overlooked are *mucous patches* and *leukoplakia*. Mucous patches in late syphilis consist of thin areas of desquamation covered with filmy membranous layers which may occasionally be raised, eroded and ulcerated. Leukoplakia are hyperplastic scars of mucous patches with which they often co-exist. In late syphilis, they have the typical greyish or silvery-grey surface with an indurated background and sharp margins. They have a selective disposition, being generally seen in the mouth and are described as labial, angular or commissural (angles of mouth), glossal (glossitis), gingival (gingivitis) and buccal or fauceal leukoplakia. The glans penis, vulva and vagina are rarer sites, though not infrequent. These are one of the most resistant types of late syphilitic lesions as they persist while other co-existing lesions disappear under treatment. I have found that copper and iodine ionizations have controlling and thinning effects on these lesions. A patch of leukoplakia makes one suspicious of syphilis and apprehensive of their malignant transformation. In some cases, D.G.I. of scrapings and juices might reveal treponema.

Submucous gummata with or without surface lesions are not uncommonly seen in late syphilis.

Case Report 23—An elderly member of the legal profession consulted me for irritation of glans penis several years after a doubtful infection. Examination: a patch of leukoplakia with desquamation on the glans and prepuce. Local applications and iodides and hydrarg kept it in abeyance; it never cleared up till he died rather suddenly of thoracic complaints (mediastinitis) about 10 years later. He objected to injections.

Case Report 24—A senior consulting physician asked my advice about a growth on the fauceal wall of a zemindar. Examination: there was a nodule on the anterior wall and its surface and mucosa had patches of leukoplakia. The tongue also showed signs of glossitis. History: treponemal infection denied; clinically and serologically, positive. On suggesting antisyphilitic treatment and electro-cautery, he turned off to a homœopath. Months later, I was called in urgently to see a patient who was bleeding profusely from his throat. I could hardly recognise this cachectic person with much enlarged cervical lymph nodes and his fauces half filled with a mass of malignant-looking growth. He was very repentant and as articulation was not possible, wrote to say that he had been a fool and was now prepared to undergo operation and injection treatment'. Of course, it was too late. He died within a week of palliative treatment.

Case Report 25—Asked to see a European child with a rash. When I called, parents were out and I found the ayah kissing the child on her mouth. As I was remonstrating with her, the parents arrived and joined me in taking her to task. Watching the ayah I noticed a swelling just above her chin and on examination I found a submucous labial gumma and erosions on the buccal mucosa. She admitted that her husband has had syphilis and thought that her buccal condition was due to chewing *pan* and tobacco.

Syphilitic glossitis, not infrequently associated with labial, buccal and pharyngeal leukoplakia and submucous gummata is not uncommon in the late stages of syphilis and signifies latency. Often, patients attribute other causes for those conditions but the detection of associated conditions and evidences of latency makes the diagnosis easy, further strengthened if there is a confirmatory laboratory diagnosis. These cases are of clinical and diagnostic importance because if neglected they are quite *liable to undergo malignant changes*. Desquamation, loss of papillæ interspersed with cicatricial bands causing striations should be looked at with suspicion and treatment commenced forthwith. If they do not respond to antisphilitic and other methods of treatment, the disposition of cellular elements should be studied in microscopic sections of the tissues. If malignancy or even pre-malignancy is suspected, surgical measures are adopted but antisyphilitic treatment should follow because a fresh lesion may appear nearby which may likewise undergo malignant changes. These lesions may show evidences of tissue necrosis and erosions and ulcers may yield a variety of saprophytic flora on culture. These are often attributed to *pan* and tobacco; this and other alleged causes for these conditions may be misleading. D.G.I. and serum and C.S. fluid tests should be done and repeated if necessary in order to eliminate syphilis. Cervical and thoracic skiagrams are sometimes useful for differentiation. Two illustrative cases deserve citation:

Case Report 26—A young zemindar went to America for post-graduate study after the birth of his first child and while there suspected infection from a (single) exposure as it caused a small ulcer on the glans penis and psoriasis on the preputial folds. Being susceptible to arsenic, had bismuth injections; the ulcer healed but an erosion appeared and this kept getting better and worse proving intractable to further treatment though S.W.R. became negative. Returned from America and got several attacks of malaria in his zemindary. Felt run down and consults. Examination: remains of psoriasis with nodular indurations on the glans; plantar psoriasis; anæmic; S.W.R. strongly positive. Improved steadily under guarded arsenic therapy; S.W.R. became negative. Discontinued treatment. Returned after a year with typical glossitis and a submucous nodule on the gum. S.W.R. positive again. A further course of arsenic and bismuth therapy, the nodule subsided and the glossitis partly cleared. S.W.R. kept getting positive and negative and even recently it is either doubtful or slightly positive. This is evidently a case in which the immunity response was dislocated resulting in latency.

(*Continued on page 91*)

THE USE OF NICOTINIC ACID IN THE TREATMENT OF TYPHOID FEVER

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Nicotinic acid though not identical with the pellaga-preventing factor of vitamin B complex is probably its precursor. The work of Spies *et al* (1938) has stressed on the vasodilator action of nicotinic acid and closely related substances, and the effect of these substances on the mental symptoms of pellagra. Nicotinic acid or substances closely related to it are essential for the integrity of the cells of the body. According to Sebrell (1941) normal adults require about 18 mgms. of nicotinic acid daily. A sufficiently prolonged deficiency of nicotinic acid or its allies results in ill health and eventually in pellagra.

In a protracted febrile illness like typhoid fever which is treated with restricted diet, vitamin deficiencies are liable to occur in the patient sooner or later, apart from an existence of basic dietetic deficiencies so commonly met with in the poor hospital patients.

Vitamins A and D have been observed to benefit typhoid cases, as also vitamins B_1 and C. Vitamin C coupled with extract of suprarenal cortex has been found useful in typhoid fever.

The writer in the latter part of 1940 felt that nicotinic acid should be given a trial as an adjuvant in the treatment of typhoid fever and from that time has been regularly using the same in severe cases with satisfactory results.

In the latter part of 1940 and the early part of 1941, twenty five cases of typhoid fever in adults and children of either sex were given each 50 mgms. of nicotinic acid orally, and each case had a contemporary control under practically identical conditions regarding virulence of the infection (gauged by Widal reaction), treatment, and nursing facilities.

Nicotinic acid was given in two main groups of cases with benefit—Group I manifesting severe mental confusion, delirium, insomnia and even maniacal tendencies and Group II manifesting one or more of excessive oral ulceration, constipation, tympanitis, and diarrhœa.

Striking results as noted below were observed in those cases treated with nicotinic acid as compared with the control cases particularly in alleviating orolingual ulceration, mental unrest including delirium, mental confusion and insomnia; and genito-urinary complications like vulvovaginitis in females. Continuous oral administration of the substance immediately after diagnosis for a period of 10 to 15 days, appears to have warded off particularly oral ulceration and mental unrest, and saved a good bit of nursing attention.

Hæmatoporphyrinuria is present in pellagra which has a specific response to nicotinic acid. In four cases of typhoid fever not getting nicotinic acid, and two cases getting the same, no hæmatoporphyrinuria was detected. The use of the drug has not been attendant with any ill effects.

GROUP I

Nicotinic acid treatment	*Controls*
1. D. Adult male. B. typhosus isolated from blood. Mental confusion profound. Deafness present. Within 7 days of administration of nicotinic acid, mental confusion and deafness cleared.	1. P. Adult male. B. typhosus grown from blood. Mental confusion profound. Insomnia present. These symptoms cleared much later.
2. D. Adult male. B. typhosus grown from blood. Delirious and maniacal. Within 48 hours of administration of nicotinic acid the patient became quiet and enjoyed good sleep.	2. S. Adult male. B. typhosus positive 1 in 200 (Widal reaction). Mental confusion and delirium very marked. These decreased with the decline of the disease only.
3. S. Adult female. B. typhosus isolated from blood. Maniacal, sleepless. Within 72 hours of the administration of nicotinic acid the patient became quiet and had good sleep. Recovery of memory was remarkably quick.	3. A. Adult female. B. typhosus positive 1 in 200 (Widal reaction). Restless, confused and very toxic. Recovery of mental condition followed after the temperature came down.

GROUP II

1. M. Male child. B. typhosus positive 1 in 200 (Widal reaction). Had oral ulceration and parotitis, which cleared within 4 days of the use of the drug.	1. D. Male child. B. typhosus positive 1 in 200 (Widal reaction). Had marked oral ulceration which cleared in 15 days with usual oral hygiene.
2. D. M. Male child. B. typhosus positive 1 in 200 (Widal reaction). Nicotinic acid was used early in the second week till discharge from the hospital. No oral ulceration or coccal infection of the skin seen.	2. N. Male child. B. typhosus positive 1 in 200 (Widal reaction). Died of oral ulceration, diarrhœa and septic infection of the skin, and exhaustion.
3. K. Male child. B. typhosus positive 1 in 50 (Widal reaction). Had oral ulceration and hypersalivation, which responded easily.	3. C. Female child. B. typhosus positive 1 in 50 (Widal reaction). Had meningism, delirium, oral ulceration and later developed vulvovaginitis.

COMMENT

Mental disturbance in typhoid fever may be in the form of mania, melancholia or dementia. Temporary deafness is observed in the course of the fever. Nicotinic acid has benefited certain cases of deafness probably by its vasodilator action. Delirium tremens may also complicate typhoid fever in alcoholics. Delirium tremens has been found responding favourably to nicotinic acid therapy. Lewis (1940) writes: "The treatment of various psychoses on the assumption that they are due to the deficiency of a particular vitamin is not limited to alcoholic conditions, though it is in regard to them that enthusiasm is most evident." Cleckley *et al* (1939) found remarkable improvement with nicotinic acid in elderly

stuporose patients, in whom such conditions as frontal lobe tumour or encephalitis lethargica or chronic subdural hæmatoma have been suspected. Stupor due to cerebral tumour, bromide intoxication or cerebral thrombosis did not improve on nicotinic acid treatment.

Nausea and vomiting consequent upon sulphonamide intoxication are benefited by nicotinic acid, and this fact has also tempted the writer to continue the administration of nicotinic acid in typhoid fever.

The oral ulceration of pellagra and sprue are remarkably benefited by nicotinic acid therapy. Therefore it is that nicotinic acid was tried and that with utmost satisfaction in orolingual ulceration occurring in typhoid. Barnes (1941) writes: "Most who have worked on the question are agreed that a great many of the lesions classed as stomatitis are really deficiency diseases. King (1940) who had failed to infect himself with the organisms of Vincent's angina, assumed that there must be some deficiency (of B factors) in these cases, and has treated them successfully with nicotinic acid." Rau and Raman (1936) and Raman (1940) stressed on the diet of pellagrins in South India as being rich in carbohydrates and poor in quality proteins and protective food substances. A poor South Indian is a rice eater and his diet is notoriously poor in quality proteins and protective substances; and if such a person is a victim to typhoid fever, he can be assumed to be on par with a potential pellagrin with regard to deficiency of, at least, the co-enzyme containing nicotinic acidamide. The writer suggests that this predisposes to marked mental symptoms and orolingual ulceration in a certain number of the severe cases of typhoid fever. On this basis nicotinic acid is expected to maintain its therapeutic role in typhoid fever.

Conclusions

1. Nicotinic acid has been used in 25 cases of typhoid fever with benefit.
2. Its use is devoid of any toxic effect.
3. Earlier administration of the substance appears particularly beneficial in combating orolingual ulceration, hypersalivation and the mental symptoms like confusion, delirium and insomnia and reduces the period of hospitalisation of patients.

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SPECIAL ARTICLES

I
THE LISTER TECHNIQUE

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Recently there has appeared in the medical press a number of pleas for the revival of the Lister technique to assist in the treatment of war wounds. The correspondents have been mostly senior surgeons and they have deplored the ignorance of the present generation of this technique in spite of the pre-eminence of its founder.

Lister in his day had to face a problem even greater than that of the terrible wounds that are inflicted by modern war. These wounds are purposely inflicted by other men with the object of causing death or mutilation. But the problem that Lister had to face was that the hospitals, which were provided for the help of those who were accidentally wounded or required operation, were themselves the cause of foul and agonising death. They more than failed in their purpose; they became its very opposite. If a man met with a compound fracture as the result of an accident, then, as John Bell, the distinguished surgeon, pronounced, it were better for him to be placed on a dunghill or in a stable than in a hospital provided for him by authority or charity.

In the year 1865 Lister, when thirty eight years of age, read Louis Pasteur's Recherches sur la Putrefaction. He read that Pasteur had put putrescible matter into glass flasks, boiled it and sealed the drawn-out mouths of the flasks while the liquid was still boiling. For however long these flasks were kept unopened, the matter in them did not putrefy. But, if drawn-out mouth were broken so that air entered from outside and the mouth was again sealed, putrefaction invariably took place. If, on the other hand, flasks were opened and resealed on the glaciers and snows of lofty mountains, putrefaction very rarely occurred. Hence Pasteur concluded that putrefaction was due to the microbes in ordinary air.

The great work of Pasteur found an immediate convert in Lister, who, apart from his work as a practical surgeon in a large hospital, had given almost all his thought to the terrible problem of sepsis and had done much research work of a brilliant character on the nature of inflammation. "In the fields of observation" said Pasteur in an address at Lille, "chance only favours the mind that is prepared." Lister's was the mind prepared.

Lister at once set to work to apply Pasteur's work to practical surgery and sought for a chemical, which would kill the microbes that caused the putrefaction of wounds. The chemical of his choice was carbolic acid. The carbolic of that time was a dark fluid with tarry impurities and practically insoluble in water. So Lister was at first forced to use it at full strength. It might seem that this would poison the patient, but it did not do so. What it did do was to excite the exposed surfaces to bleeding, the blood mingled with the carbolic and formed a hard crust. This was the first form of Lister's famous antiseptic scab, which sheltered the wounded parts beneath it.

In Lister's hands this scab earned a partial success, but the crude carbolic burnt the surrounding skin. This started Lister's innumerable experiments from which the artificial scab emerged in the form of double cyanide gauze wrung out in a solution of 1:20 carbolic lotion applied direct to the wound; then a layer of dry gauze and over this dry cotton wool impregnated with carbolic acid. In the natural scab the under surface is wet yet clean, but the outer surface is dry. It should keep dry; an excess of wetness spoils the protective character of the scab. The scab is also pliant and does not break up with moderate movement of the injured part. Lister's scab followed these qualities; the inner surface was wet but not putrescent; the outer part was protective and dry, and lost its protective character when over-wetted; the dressing was pliant and its efficacy not broken by moderate moevment of the injured part.

There was also antiseptic operative technique, the cleansing of the patient's skin, the hands of the operator and his assistants, the cleansing of the instruments, dishes and sponges or swabs, and, in the early years, of the air itself by means of a spray. For all these Lister relied on solutions of carbolic acid. This solution, Lister found, was blessed with a valuable peculiarity in that living organic substances, such as hair, skin, nails, fat and other tissues, selected carbolic from the water of its solution and became impregnated to the extent of 1:5 in place of 1:20. They also retained the carbolic well. Lister found that his hands, dipped into 1:20 carbolic lotion for half a minute, were made non-infective for the time of the operation. This capacity of being held lightly by water and of ready transference to living organic matter, Lister always maintained was "a very great point" in his technique. Armed with it he built up a system of extraordinary simplicity and boldness, which he followed with complete confidence for thirty years of operative work. This system included the mastery of the complication of arterial hæmorrhage, which he established by several years of experiment, visits to factories of gut, experiments in twisting, scraping, drying, seasoning, etc., finally resulting in chromic gut.

We can now get a picture of Lister operating. The room, in which he operates, is an ordinary one, costing no more than any other room. The table on which the patient lies is an ordinary table, a plain wooden kitchen table sufficing in a private house. The patient is on the table and the skin in the area of the operation is washed over with 1:20 carbolic and covered with a towel or cloth wrung out in this solution.

Lister takes off his coat and puts on an overall to protect his clothes. He turns up his sleeves, washes his hands in soap and water, rinses them in fresh water and holds them in a basin of 1:20 carbolic for half a minute or more. He is then ready.

He does not use a nail-brush. He does not scrub his hands for several minutes. He does not put on boiled gloves, boiled robes, boiled cap or boiled mask. He remains like an ordinary being in the eyes of a spectator, and is not attired like a mummer at a carnival, as is the aseptic surgeon,whose 'improvements' he never adopts for the reason that he has faith in carbolic acid used intelligently and conscientiously.

For his instruments there are dishes of the same lotion. After their previous use, they have been scrubbed in soap and water, dried and stored in a cupboard. They are now taken out of the cupboard, put straight into the dishes and covered with the solution. "For the instruments" taught Lister, "it is very much more convenient to be able to purify them by a solution like this than to boil them."

With this technique, operative wounds healed with the greatest regularity both in Lister's hands and in those of his followers. They did not have the failures which, however careful, the aseptic system occasionally exhibits. In the words of the greatest French surgeon of his day, Dr. Lucas Championniére, himself a faithful follower and personal friend of Lister: aseptic surgeons "introduce new and incredible precautions incompatible with regular practice. And yet have they altered the results of sugery? Certainly they have caused it to lose its safety. That which Lister assured—the mathematical safety of surgical work done in accordance with the precautions indicated, applicable under all circumstances, in all places, with all patients, and without lengthy preparation—that security has disappeared."

It has disappeared under the conditions of the present war. It cannot then be a surprise that those, who know Lister's technique and its safety and simplicity, have urged its revival in the treatment of war wounds and believe that it is the method of choice as "applicable under all circumstances, in all places, with all patients, and without lengthy preparation," nor that they deplore that to the majority of the younger generation of surgeons the practical application of the Lister technique is unknown.

This article will not be complete without a reference to the special war wound dressing, which Lister advocated in a short pamphlet in the year 1870, at the outbreak of the Franco-German War, and but three years after his initial trial of carbolic acid. The first step in the treatment was the excision of the dead matter in the wound. After this the injured tissues were cleansed with carbolic lotion and antiseptic ligatures tied on bleeding arteries. The cleansed tissues were then covered with a piece of oiled silk smeared with carbolic oil. This was the bland inner dressing or inner surface of the scab and was *not to be removed.* Layers of lint wrung out in oil were placed over this. As blood or pus soaked into these layers, the outer ones were removed and renewed. When oozing ceased, the outer layers were moistened with the oil every two days. *The wound was thus kept in a state of protected rest and its healing left to the healing power of nature* under the layer of irremoveable oil silk. The closed plaster treatment, introduced by Dr. Trueta in the Spanish Civil War and widely adopted for war wounds in subsequent wars, is the Lister technique and principle in a later form.

(*Continued from page 79, column 1*)

Chronic sufferers of many ailments associated with psychoasthenia may be commanded by a yogi physician to develop a will force on lines of yoga to rectify their inherent mood and achieve a cure. It is, however, unsafe to entrust a patient to an imperfect yogi, devoid of any knowledge of medicine.

Conclusion

The writer thinks that the practice of yoga is quite simple and easy if one is taught the principle. Then practice brings on success. A practice of yoga in the wrong way may produce dangerous effects; incurable diseases of the body and mind may develop which may become fatal.

II

YOGA—THE METHOD OF PSYCHO-PHYSICAL CULTURE

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Introduction

Yoga though essentially a path for the practice of religion for the attainment of peace, has been found by actual practice, to be really a perfect method for psycho-physical culture and as it promises an amelioration of human suffering, it is undoubtedly a subject of medical interest.

In yoga, there is culture, for the development of a will-force, which enables one, to control the physiological activities of the body and govern the mind. The body and the mind are systematically worked up to a perfection, both being trained simultaneously or rather side by side, one influencing and helping a betterment of the other. Finally, a stage is reached where there is a complete inhibition of the body and obliteration of the mind (a stage of the realization of the third unknown factor—the soul).

A personal attainment of the static phase (*samadhi*) is essential, for the realisation and study of the yogic phenomenon. From the point of view of research, scientific investigation of the yogic phenomenon is essential. Extreme difficulty in the way of investigation exists. Though the academic value of such investigation may be very high, yet the practical profitable evolvement of such painstaking, sacrificing and expensive work, will never be so high or proportional. The scope for the application of the theoretical knowledge of yoga, by practitioners on cases, will invariably be disappointing. Because a yogi can defy the principles and laws of science, it does not mean that one can find any reason to underestimate the practical profitable and utilising value of modern science. In perfect and deep concentration certain phenomena appear in succession. The phenomena when worked up create a condition favourable for concentration—this is yoga and probably a clue to its discovery.

The physical phenomenon that occurs, and the strength that is developed in the body and the mind, can be explained to some extent by our knowledge of physiology. Reasons, however, seem to fail to explain satisfactorily as to why there should be such attainments as a result of the practice of this peculiar and particular method only. Remarkable changes in the body and face under will, control over involuntary organs, suspended animation and other facts that have been conclusively demonstrated by yogis are phenomena which defy the laws of physiology and psychology. Behaviourism of mind in the phase of wilful inhibition of the functions of the body is yet beyond the range of the vision of the modern scientist.

We know from our knowledge of physiology that there exists, an inhibitory influence of the upper motor neurons over the lower motor. A removal of this inhibitory influence of the higher cerebral centre, leads to the predominance of the activities of the lower centre, as is found in a case of transverse myelitis of the spinal cord, on areas supplied by the nerves, originating from below the seat of the lesion. As a result there is contraction of the muscles leading to spasticity. We also know how strong, powerful and painful are the contractions of the muscles in a case of tetanus and other diseases of the nervous system. A yogi by his volitional activity over the whole nervous system, creates various types of analogous phenomena, in a non-pathogenic way and enhances his physical power to withstand every adverse state of the body and achieve a mental stamina to ignore the most painful physical sensations.

Stages of Yoga

The exists stages and phases. Essentially, there exists three stages, namely, *overstimulation, rest* and *recuperation.*

By a slow gradual, yet prolonged and persistent practice of yoga—of a thought of ascending and descending travelling impulses, along the brain and the spinal cord associated with the phenomenon of respiration, a stage is reached, where the fixation of the impulse to a particular area in the brain, leads to an automatic cessation of breathing. This phenomenon by gradual practice deepens into a phase of complete inhibition of the body and mind into a static stage, the face and body ultimately assume a state of firm rigidity. The phenomenon of contraction appears slowly through the segmental level of the cord, from below upwards and gradually reaches the medulla oblongata and with it develops the capacity to withhold respiration for long periods with ease. Signs of hyperactivity of the abdominal viscus appear. The heart beat also becomes slow and soft. In the early stage of practice, the impulse does not obey or follow the thought. Later on, impulses develop but fail to reach the same high level as the thought. With deeper practice fixation of the mind to a higher area automatically effects a basic preliminary change in the body. In still higher practised phases, wilful obliteration of mind, without preliminary changes of body becomes possible, when after obliteration of the mind or simultaneously, the body phenomenon supervenes. When the impulse is lifted higher up, hyperactivity of the bowels tends to disappear, the respiratory phenomenon (when respiration takes place) becomes smooth and comfortable, indicating dilatation of the bronchioles and the lung capillaries. In rare cases, in the early stages of practice, there may appear an undesirable phenomenon—namely a quickening and throbbing of the heart and with it pain and distension of the abdomen. In the subsequent stage of practice, there appear a normality everyway but a tendency to the inhibition of respiration and further slowing and quietening of the heart are the common noticeable features. These symptoms indicate a preliminary parasympathetic hyperactivity calling upon the sympathetic system to assume antagonistic activity, till there is a final adjustment to a balanced action. Do they mean, actions of thyroid and suprarenal glands or pituitary and adrenal, their activities and adjustments? In certain stages there appear symptoms pointing to predominated activities of the entire sympathetic system. By this process, the secondary, subsidiary and local nerve centres are brought to an efficient stage. Improved vasomotor system accelerates the function of the endocrine glands and co-ordinates their balanced action. Anæmia or congestion of any tissue in the body may lead to a pathological state as atrophy or hypertrophy. There is a development of control over viscera and free circulation of cerebrospinal fluid. (The practice of different types of *pranayam* and various

mudra tones up the constitution). Prostate is the gland over which the control appears first and the power to ignore stimuli originating from the olfactory nerve appears last. An improved function of the alimentary system and development of detoxicating power, regulate metabolism. Phase for attaining concentration is, however, a late phenomenon as such there exists a possibility of degradation into ambitious propensities of sex and avarice. In the early stage of practice, or in the practice of certain individual items in yoga, there appear symptoms of katabolism. There occurs reduction of weight and fat. The body becomes lean and thin.

When the impulse reaches the midbrain, tremors and convulsions appear, together with a greater tendency to the stoppage of respiration and heart. The vital centres have a tendency to resist influence of the impulse and they obey the impulse when the body can tolerate their inhibition. It becomes, at first difficult to concentrate because of the unrest of the body, but gradually the mind is trained to ignore the effect on it and to suppress the jerks. The mind at this phase, is trained to be fixed on tinnitus which appear, as phases of temporary inhibition become frequent. The mind gets fixed on fine sound. As the mind gets itself absorbed in concentration signs of inhibition become more marked, and although there may be mild respiratory function, it becomes imperceptible. There may be a tendency towards inclination of the head to one side, there may be elongation of body and the joints appear to be loose (cerebeller phenomenon.) The body may retain the normal feature, but the face reflects the features of infantile convulsion. Then the body and face begin to assume stony appearance. The face becomes expressionless (mask-like). This is the phase where the physical and mental powers acquired become superhuman. It is to be noted that the muscular contractions that take place in the body during practice of yoga, are slow and gradual in their process of development and intensity. It being of nervous origin of a volitional type, activity is permitted upto the tolerable limit of the body and mind. Thus gradually as the power of body and mind increases, the force of contraction also increases. It gives a systematic regulated massage, in a physiological way, to the voluntary as well as to the involuntary muscles and to all the tissues of the body. The process prevents spasmodic phenomena and removes pathological deposits or accumulations. The internal organs are educated to bear severe stress and strain The serous membranes are forced to a greater range of functional activity which tones up and prevents any possibility to adhesion, of course, there may be experiences of pain in local regions (of a traumatic character).

As the mind gets absorbed in tinnitus aureus, simultaneously it becomes possible to lift up the impulse successfully higher up, a flash of light—flame shaped, appear above the nose, below and in front of the centre of the eyebrows visible even with the shut eyes. Firm contraction of individual muscle as that of a finger with fine tremors begins to appear. The body becomes hard and stiff, when these phenomena of twitchings subside, due to complete absorption of mind in the Holy Light. (This phenomenon may also be achieved by inhibition of the medulla through the tongue control method—the body phenomenon in which case become secondary).

Co-ordination of consciousness begins to pass away. Pulse becomes weak, slow and finally imperceptible. The heart beat becomes inaudible. The body becomes flaccid and soft and unless supported falls forward but the jerk stimulates the body

FIG. I—*Yoni mudra* (SIDE VIEW)

FIG. II—TRANCE (INVERTED POSE)
Bipariti karani mudra

to activity. The phenomenon of obliteration of the mind is due to the meditating personality fusing with the object of meditation. The physical effect is the apparent flaccid paralysis or really paresis (of nervous origin) of the body.

The flaccidity appears first on the body from below upwards and the rigidity of the face passes off last. The phenomena of contraction, trance and flaccidity do appear in a yogi even in the inverted pose and the fact has been a proved one. To create these phenomena, the yogi practises *yoni mudra* (a higher type of breath control along with visceral control) and *khechari mudra* while in the erect inverted pose (*bipariti karani mudra*) and he must be in this pose at a stretch daily for about an hour.

The phenomenon of suspended animation may be explained to be due to the inhibition of the psychic area of all the nerve activities but its own cells which keep on life, by their mild or practically inappreciable activity. This gives an insight into soul-travel phenomenon. In the process of revival,

the feebly alive cells of the psychic area revive themselves and then set up impulse on to other brain cells to activities. Should there be suspended animation for some period, post-mortem-rigidity-like condition supervenes. This is the phase of yogic perfect rest.

In the stage of revival or in the stage of relaxation after contraction, the whole body assumes a soft condition, and the face reflect a care-free and thought-free appearance (which gains him respect). The perfect flaccidity at this stage owes its origin to the improved and superior control of the upper centre over the lower. This is the stage of yogic recuperation. The physiological activities of the body henceforth become mild. The upper centre works free from any irritative influence from the body. The mind and body become subservient to the will of the individual. The mood of the individual completely changes for good, for which he can exhibit an art which outwits nature. He is one who is fully satisfied every way because of his power and knowledge. The phase described above is known as the *sambhabi* stage, when the understanding reaches very high. There is development of great power of observation and foresight, deep insight into human character, power of thought-reading, capability to control and command everything, men and animals, but no tendency to exert or exhibit will force. He prefers simple innocent social life.

Briefly speaking, yoga increases the vitality of the tissue cells. It trains them to withstand the vicissitudes of environment. It provides rest to the circulatory, respiratory, metabolic, endocrine, excretory and nervous systems, with occasional severe stimulation of these systems; rest, however, is maintained for a period longer than that of overstimulation. It saturates the blood with oxygen and yet trains them to withstand deoxygenated condition. Every body cell is trained to be at rest. The effects are achieved by enhancement of the psychic power.

In the method of yoga described above, there is no exertion of physical force, so there is no strain or fatigue, as such no risk of hypertrophy, degeneration and failure of any organ, as in physical exercise.

Benefits of the Practice of Yoga

The practice of yoga, if successfully performed, causes an improvement in health, and increases stamina of the mind. It creates field for research in physiology and psychology. It conveys a better understanding about the causation of many obscure ailments such as high blood pressure, debility, neurosis, psychosis, hysteria, insanity, premature senility, deficiency and imbalance of the endocrine glands and a host of chronic maladies which brings on despair to the sufferers.

In chronic cases, particularly showing primary or secondary mental weakness, there gradually supervenes loss of function of the nerve cells and fibres, analogous to the organic changes that take place in other tissues for prolonged suspension of function. Perfect functional activity of the entire nervous system is essential for health and longevity.

By the process of yoga, dormant nerve cells and fibres can be stimulated to activities and trained to subserve useful functions.

Pathologically excited or irritated nerves (which account for pathological mood and behaviourism of the human being) can be regulated to a state of normality.

(Continued on page 76, column 2)

MEDICAL PREPAREDNESS SERIES

The war coming on to the borders of India has revealed to us all the terrible aspects of the menace and it has become appparent that the profession shall have to take up quite a large share of responsibility in A.R.P. measures. A series of articles on war medicine, A.R.P. and allied subjects is being published with the idea of helping the cause of necessary medical education. This is the eighth article of the series—Editor, *J. Indian, M. A.*

WAR INJURIES OF THE EYE

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Introduction

Perfect vision is a valuable asset to all. It is true for all civilians in peace time and very few people understand the importance of it so long as they have perfect eye sight. It is only when they lose sight that they understand what they are missing in their day to day life. It is also true for combatants engaged in warfare. For effective prosecution of war, visual acuity, colour vision, stereoscopic vision, ability to see well at night, normal field of vision are quite as important as the mechanical weapons which work with mathematical precision. In this war, people have been conscripted from all classes as combatants, and it is surprising to what extent visual defect, night blindness, colour blindness and defects in the binocular vision exist in apparently healthy subjects. In order to avoid sharp, and ever-searching eyes of air pilots and gunners, ingenious human brains have evolved a system of camouflage, by which they can outwit the most intelligent persons. Camouflage is playing an increasingly prominent part in this war, specially in jungle warfare.

It is not within the scope of this article to write about higher physiological principles of vision, but it is really meant for general medical practitioners to make them familiar with what type of injuries they expect in warfare, how to tackle them, their prognosis and treatment.

(1) Foreign Bodies in the Eye

Various types of foreign bodies *e.g.*, sand, earth, stone, copper, iron fragments, glass may enter the eye in war injuries. Some are accessible, embedding themselves in superficial layers of cornea, lids or superficial surface of sclera; some, however, become inaccessible and go deep inside the eyeball.

Those which are accessible are removed under surface anæsthesia by means of a foreign body spud or needle. Multiple small foreign bodies embedded in the deeper layers of the cornea, causing no pain or producing no inflammatory reaction, are best left alone because not only they are very difficult to remove, but in attempting to remove them it causes gross corneal opacities and produces irregular astigmatism resulting in much diminution of visual acuity.

A foreign body embedded in the sclera should be approached by making a conjunctival flap and turning it down, and then

lifting up the foreign body with a spud or needle and suturing the conjunctival flap over the wound. If injury to sclera (not penetration) is suspected, scleral sutures should be applied before removing the foreign body.

Presence of ciliary injection and corneal damage calls for the usual routine instillation of atropine 1% solution, hot bathings, an eye shade and in some cases pad and bandage if there is no conjunctival discharge.

Perforating wounds with retention of a foreign body. In civil life, most of the retained foreign bodies are a piece of steel, arising from the use of a hammer and chisel, whilst striking on an iron or a steel object. On account of the heat that is produced during striking of a hammer on a chisel, the foreign bodies that come from either of these two objects (mostly chisel) are more or less sterilised and, therefore, do not cause any gross infection. If, however, the foreign body comes from any other source, it might be grossly infected and cause suppuration and panophthalmitis.

Foreign bodies that enter the eye in warfare are of several varieties, and may arise from portions of exploding shells, bullet casings, grains of quartz from the ground or small pieces of cordite. Shell and bullet casing particles are magnetic whilst others are nonmagnetic. Thus whilst in civil life nearly all intraocular foreign bodies are magnetic, in war injuries one can never be sure whether the particle that entered the eye is magnetic or nonmagnetic. In a quite large number of cases intraocular magnetic foreign bodies are removable, but attempts to remove nonmagnetic intraocular foreign bodies are associated with a considerable amount of difficulty and danger. The retention of iron and copper particles within the eye nearly always leads to deterioration of the eye, and ultimately those eyes have got to be removed.

In diagnosing whether a foreign body is retained within the eye or not, history is very important, which will give a clue as to the mature of the foreign body. A small perforating wound, specially if accompanied by a wound of the iris or lens, unaccompanied by a prolapse of the uvea is very suggestive of a retained foreign body. Generally, if there is prolapse of the uvea, aqueous escapes and the foreign body is likely to be washed out. In all cases, ophthalmoscopic examination should be carried out on the fully dilated pupil. In all doubtful cases, stereoscopic x'ray should be taken or x'ray by a cross wire or contact glass, which will give more or less accurate localisation of the foreign body.

Treatment and prognosis depends much on whether the foreign body is intraocular or extraocular. If x'ray photography means a considerable delay, it should not be insisted upon, but valuable information can be had by the use of an electromagnet used in the extraction of a magnetic foreign body. If during the application of an electromagnet a patient complains of pain and a sensation of dragging we can be sure that not only the foreign body is retained but it is magnetic and possibly intraocular.

Removal of a magnetic intraocular foreign body is a difficult procedure and should be left in the hands of a specialist. A few words may not be out of place in this connection. It is almost always necessary to remove an intraocular foreign body *via* the anterior route. The posterior route consists in the use of a hand electromagnet introduced through a scleral opening.

This invariably leads to escape of some amount of vitreous and moreover in war injuries as we can never be sure whether the retained foreign body is magnetic or not, the insertion of a hand electromagnet into vitreous may be useless. Therefore, the procedure adopted is to bring all intraocular foreign bodies into the anterior chamber by means of a large electromagnet and then to remove it from the anterior chamber by means of a hand electromagnet, whilst the foreign body is always kept under observation. The details of the operative procedure is highly technical and is not within the scope of this article.

(2) Contusion and Concussion Injuries of the Eyeball

The ocular lesions caused by injuries which do not penetrate or perforate the eyeball vary from a simple subconjunctival hæmorrhage to rupture of the globe and considerable disorganisation of the eyeball as a whole. In all cases a very guarded prognosis should be given as in some cases, with an apparent trivial external injury, marked fundus changes occur resulting in considerable diminution of visual acuity and changes in the visual field.

Cornea—Simple corneal abrasion may occur affecting the corneal epithelium. If not secondarily infected they usually heal within forty eight hours with simple treatment *e.g.*, warm bathing with normal saline, ol. parolein drops and pad and bandage. If the Bowman's membrane is not damaged, they heal without any scar formation. If the deeper layers of the cornea are involved, healing is always associated with scar tissue formation, and if the resulting opacity is situated near the pupillary area, it will reduce visual acuity and cause irregular astigmatism.

Recurrent corneal erosions are possibly due to the failure of the regenerated epithelium to become securely anchored to the Bowman's membrane. Curettage of the loosened epithelium, application of carbolic acid to the edge and pad and bandage may assist in the healing process.

Sometime deep opacities do occur in the cornea due to accumulation of lymph in the interlamellar spaces. They usually clear up without leaving a permanent opacity.

Blood staining of the cornea occasionally occurs from contusion injury which has caused hæmorrhage in the anterior chamber. It clears up very slowly and gradually from the periphery towards the centre of the cornea, the whole process taking about a couple of years to clear up.

Iris and Ciliary body—Traumatic mydriasis, myosis, diminution in amplitude or loss of accommodation, iridodialysis, cyclodialysis, multiple rupture of sphincter pupillæ, anteflexion or retroflexion of iris and traumatic aniridia may occur.

Mydriatics should not be applied in rupture of sphincter but it should be applied in iridodialysis. Rest to the eyes and cold compresses are necessary.

Lens—The suspensory ligament may be ruptured, completely or partially, causing a dislocation of lens into vitreous of a subluxation. When complete, the lens sinks to the bottom of the vitreous cavity where it is seen as a yellowish mass. The subluxated lens is diagnosed by irregularity in the depth of the anterior chamber (deeper in the part unsupported by the lens), iridodonesis limited to the unsupported part of lens on the slightest movement of the eyes and by ophthalmoscopic examination when the edge of the dislocated lens is seen as a black line. The treatment of these conditions depends on various factors and

is rather difficult and, therefore, should be left in the hands of competent ophthalmologists.

Sometimes due to contusion injury, traumatic cataract develops which usually takes the form of a posterior rosette to start with, ultimately going on to a fully mature cataract. Sometime, however, circular anterior capsular opacity (Vossiu's ring) develops.

Vitreous—Hæmorrhage into the vitreous is quite common following contusion. There will be almost complete loss of sight. With oblique illumination, a dull red hue may be seen and with the ophthalmoscopic mirror no red reflex will be obtained. The blood may be completely absorbed leaving opacities in the vitreous and in some cases retinitis proliferans follows from organisation of blood clot.

Choroid and Retina—The choroid may be split by the force of an explosion or the concussion effect of a bullet traversing the orbit without actually touching the globe. These ruptures are usually multiple and crescentic and are situated on the temporal side of the disc, not far from it and concentric with it. At first there are hæmorrhages obscuring the rupture, later on the edge of the streaks are fringed with pigment.

In some cases a localised oedema develops at the macula (commotio retina, Berlin's œdema), which shows itself by milky cloudiness over a considerable area near and involving the central region. In some cases œdema disappears restoring the vision to normal, in some cases pigmentary disturbances occur reducing the visual acuity, whilst in others a cyst may form between the internal and external limiting membranes. Sometimes the internal limiting membrane ruptures and thereby causes a well defined circular excavation giving rise to a "macular hole."

Retinal detachment may be caused by a concussion injury, inter-retinal hæmorrhage between the pigment epithelium and layer of rods and cones, as a sequel to vitreous loss or retinitis proliferans.

In recent cases, when vitreous loss is not great, and when retinal tears and holes are seen and carefully localised, it is sometimes possible to replace the retina by surface diathermy, which induces aseptic chorioretinitis and allows firm adhesion to be formed between the choroid and retina, sealing the hole at the same time.

Sclera—Missiles traversing the orbit without striking the eye may produce rupture of sclera on the opposite side to the point of impact. The commonest site of scleral rupture is in the upper and inner side in the neighbourhood of the canal of Schlemn, about 3 mm. behind and concentric with the limbus. There is usually a great damage to the intra-ocular structures in these cases.

Optic Nerve—Avulsion of the optic nerve may be caused by a severe blast injury.

(3) Perforating Injury of the Eye

It is not always easy to diagnose a perforation. It may be quite obvious presenting itself on the surface of the globe, on the other hand, it may be very difficult, the instrument or a flying piece of fragment piercing the coats of the eye through the lower lid behind the conjunctival fornix. It is very important that the condition should be diagnosed not only because the wound itself is fraught with danger, but the foreign body might be retained within the eye and the wound might have given access to an infection.

A routine examination of the eyelids and eye as a whole should be done. Hole in the iris or wound of the lens should be searched for. Loss of intraocular contents will cause fall of intraocular pressure. If there is a considerable loss of vitreous the anterior chamber will be deeper. Prolapse of the uveal tissue and deformity in the iris is a sure sign that the globe has been perforated. If there is no prolapse of the uvea, conjunctival wounds should be repaired with fine silk. Wounds of the cornea, short of perforation, heal readily with proper treatment provided they are not infected. If infected, treatment is that of a corneal ulcer with cauterisation with pure carbolic acid, frequent hot bathings and atropine.

If there is a prolapse of uveal tissue, the injury becomes much more grave and surgical interference becomes urgently necessary. The principle that should be followed is to leave the eye usually with a perforating wound and no uveal or other tissue within the lips of the wound. It is always safe to pull the iris out of the wound by clearing the edges of the wound and whilst on stretch, to excise the iris tissue. That will obviate the risk of infection getting inside the eye and minimise the danger of sympathetic ophthalmia. Details of the operative procedure are not within the scope of this article.

(4) Wounds of the Orbit

Wounds of the orbit are generally due to direct violence. Sometimes, however, they are due to extension from a fracture base of skull. Bullets inflict the most severe injuries on account of their high velocity, and in a great number of cases they cause great damage to intracranial structure and accessory air sinuses. In some cases, the orbital wall may not be perforated but they are driven in and concussion effect on the eyeball is considerable. It is important to note that radiograms often fail to show the fractures of the orbital walls.

The effects of the orbital wounds mostly depend on the velocity, course, size, shape and number of missiles. In few cases the eye escapes, but in most cases the eye is severely damaged and may lead to a complete disorganisation of the globe. Concussion of the missiles may produce any of the effects already described. It may lead to avulsion of the optic nerve and luxatio bulbi. A tear of the optic nerve in the optic foramen or optic canal will cause immediate blindness but the optic atrophy will not show up before three weeks.

The action of the extraocular muscles is often impaired owing to concussion effect, hæmorrhage, tear or avulsion from the site of origin at the apex of the orbit, or from injury to the nerves supplying the muscles. Clinically, it is diagnosed by the absence of or impairment of its action and diplopia, to avoid which the patient assumes a peculiar posture with an inclination of head towards the direction of action of the muscle put out of action.

Injury to the bloodvessels at the back of the eye may produce rapidly increasing proptosis directly forwards, subconjunctival hæmorrhages and infiltration of blood into the lids and adjacent soft tissues of the face. Damage to the branches of the ophthalmic division of the 5th nerve may lead to tropic ulceration of the cornea.

The concussion effect of a large explosion may cause a vertical tear in the upper lid. Losses in skin are corrected by

skin grafting which should be undertaken as soon as possible, otherwise, pyogenic infection may cause considerable fibrosis and subsequent contracture. For more extensive losses pedicle graft is advocated.

(5) Gaseous Injuries

The term "gas" in connection with warfare is used in an entirely different form from the usually accepted clinical term, and has got a wide meaning which includes any chemical substance, whether solid, liquid or true gas, employed for its poisonous or irritant effect on the human body. Some of them are dispersed in the air as vapours or poisonous smokes and exert their action on persons breathing the contaminated air, some, however, *e.g.,* blister gases whether in the form of liquid or vapour, can exert their action directly on the skin.

Gases which cause ocular affections—A. Blister gases. (*i*) Mustard gas (*ii*) Lewisite. B. Tear gases. (*i*) Chloracetophenone (C.A.P.). (*ii*) Ethyliodoacetate (K.S.K.). (*iii*) Bromobenzylcyanide (B.B.C.).

Mustard gas—Mustard gas is a severe chemical irritant and forms a highly toxic byproduct when it comes into contact with living tissue. Possibly it combines with the free amine groups of the protein molecules and forms a highly toxic substance.

Mustard gas is more readily absorbed by the cornea than by the skin. The vapour in 1: 10,000,000 concentration in air produces ocular signs and symptoms in 2 to 48 hours. In greater concentration the effect is much more readily produced.

Symptoms and signs—The severity of ocular affection depends on the concentration and the length of time of exposure to gas. Its action may be cumulative and sometimes there is a considerable delay in the healing process in more severe types of exposure.

In less severe cases, after a latent period, prodromal symptoms and signs appear which consist of feeling of grittiness photophobia, blepharospasm, lachrymation and injection of bulbar conjunctival vessels in the exposed interpalpebral zone.

In some cases, even after the eye is quiet, a state of anxiety neurosis appears and functional photophobia and fear of blindness become uppermost in the minds of the patients. Usually the less severe cases are cured in 4 to 6 weeks.

In more severe cases where cornea is damaged, the subjective symptoms are more intense. The interpalpebral part of the bulbar conjunctiva is white from coagulated exudate, which obliterates the capillaries from pressure. Above and below this, the conjunctiva is chemotic and bulges forwards, the lids are swollen and red. Continuous with the whitened interpalpebral bulbar conjunctiva, a wide band like opacity appears across the cornea. The cornea becomes stippled, "orange skin", oedematous and roughened. Later, the corneal epithelium shreds off and corneal sensation becomes diminished and persists for weeks. The pupil is small as a result of irritation.

Secondary infection may supervene from exogenous source and may lead to complications resulting in ultimate loss of the eye.

The residual signs of mustard gas injury are dilated tortuous, varicose, dark coloured vessels in the interpalpebral area, embedeed in a greyish white matrix of scar tissue. The whole appearance is like a marble. Greyish opacities are present in the cornea, which cause irregular astigmatism. Recurrent corneal ulceration is quite common. The author has seen cases of recurrent corneal erosions even 22 years after exposure during the last Great War.

Treatment—Prophylaxis. Whenever warning is sounded for "gas", people should keep indoors wearing respirators and should not come out till the "all clear" signal is given. People who are contaminated should pass through a decontamination centre.

In less severe cases, a simple irrigation with 2% solution Sodi Bicarb pH 8·0, instillation of pantocaine (which does not damage the corneal epithelium as does cocaine) and liquid paraffin drops and eye shield will ameliorate the symptoms to a great extent. In heavily contaminated cases, one has to carry out the treatment in antigas clothing and respirators and the wounded will have to pass through a decontamination and cleansing centre. Down Brothers have made a very convenient self-retaining irrigating speculum which allows the interpalpebral aperture to be opened to about one third of its normal extent and stream of luke warm lotion to be directed into the upper and lower fornix. When the cornea is involved atropine, and in recurrent corneal erosions tarsorrhaphy is indicated. Contact glass will also reduce the incidence of recurrent corneal ulcerations and improve the vision by eliminating irregular astigmatism.

Lewisite—It is a powerful toxic substance embodying the aggressive qualities of the asphyxiant gases, the irritant characteristics of the tear and nasal irritant gases and universal action of the blister gases on all contaminated tissues. Usually its vesicant action predominates more than anything else.

In severe burning, ocular signs and symptoms are more or less the same as poisoning by mustard gas but much more acute. If liquid lewisite is sprayed from an aircraft, the impact of the liquid on the conjunctiva will elicit immediate pain, spasm and lachrymation. There is no latent period like mustard gas poisoning and the victim becomes an immediate casualty. Clinical signs develop rapidly—extreme oedema of lid, chemosis of conjunctiva with subconjunctival hæmorrhage, extensive ulceration of conjunctiva, hazy cornea, acute pain, photophobia and lachrymation—a condition, much more distressing than that produced by liquid mustard gas in 24 hours.

The prognosis with liquid lewisite contamination is much more serious than with liquid mustard gas.

Treatment should be on the same lines as that of mustard gas poisoning but it should be started with extreme rapidity and not a single moment should be lost.

Lachrymators or Tear gases—Their action is selective and they usually only attack exposed sensory nerve endings or mucous membranes, *e.g.,* eye, nasopharynx, respiratory tract. They are effective in extremely low concentration and their effects are immediate and temporary. Withdrawal from the contaminated area is followed by rapid recovery.

Usually three compounds are being used, C.A.P., K.S.K., B.B.C. C.A.P. is usually used to disperse the mob by the police. Exposure to any of these lachrymators gives rise to an immediate irritation of the eyes, profuse watering and spasm of the eyelids and it is almost impossible to keep the eyelids open.

The respirators afford complete protection to both eyes and lungs against all concentrations. No treatment is usually necessary nor any after-effects follow exposure. If the eyes are contaminated by actual liquid from spray or bursting bombs, lavage with normal saline is all that is necessary.

CASE NOTE

MEDULLARY CARCINOMA OF THE COMMON BILE-DUCT

RAMLOCHAN DATTA, M.B.
Carmichael Medical College Hospitals, Calcutta.

Carcinoma of the bile-duct is not so rare as is generally supposed. Taking the whole biliary system into consideration, carcinoma of the common bile duct forms about 2 per cent of all carcinomas in the body. Records of carcinoma in the extrahepatic bile-duct are so few that only a few dare to calculate percentage of occurrence with respect to carcinomas of other organs in the body. At present an increasing number is being reported than before.

Etiology

Age—Majority of cases occur between 50 and 60 yeears of age. Only one or two cases are stated to have occurred below the age of 35 years.

Sex—Females are affected more often than males but in carcinoma of the gall-bladder the males suffer more (2:1). Rolleston and McNee (1929), however, hold the opposite view.

Site—The following table gives a comparative analysis of the site of the carcinoma.

	Cystic duct	*Hepatic duct*	*Confluence of 3 ducts*	*Common Duct* Upper part	*Common Duct* Lower part
Glasgow Royal Infirmary (1929-39)	3	2	—	—	13
Rolleston & McNee (upto 1929)	7	23	28	11	23
Donati (upto 1939) ..	32	—	37	48	—
Judd & Gray, Mayo Clinic, (upto 1939)	7	8	—	28	—
Lapointe & Raymond ..	—	32	37	—	—

Pathological types—Krishbaum (1941) collected from Woodlawn Hospital, Cook County Hospital and North Western University Medical School, an account of the following types in 62 cases:—

A. Cystic duct	1. Infiltrating adenocarcinoma	6	
	2. Papillary adenocarcinoma	1	7
B. Common hepatic duct	1. Infiltrating adenocarcinoma	10	
	2. Papillary adenocarcinoma	3	13
C. Common duct	1. Infiltrating adenocarcinoma	24	
	2. Papillary adenocarcinoma	5	
	3. Medullary carcinoma ..	3	32
D. Papilla of Vater	1. Papillary adenocarcinoma	7	
	2. Infiltrating adenocarcinoma	2	
	3. Squamous-celled carcinoma	1	10

Thus we see that the common situation is either the confluence of the three ducts, namely, common hepatic, cystic and common bile-duct or the lower end of the common bile-duct. It is also evident that in the majority of cases the type is "adenocarcinoma", whether infiltrating or papillary.

Case Report

N. C. D., Hindu male, 32 years, was admitted on 21-7-42, in the Carmichael Medical College Hospital, with the following complaints:

(1) Pain right hypochondrium, radiating to back for 5 months. (2) Jaundice for 5 months.

History of present illness—Onset with a sensation of heaviness and discomfort in the epigastric and right hypochondriac regions, having no relation to food. This assumed the form of definite pain of a colicky nature with radiation towards the right shoulder from February 1941 (*i.e.*, 5 months). For these five months he was noticing yellow discolouration of the conjunctiva which sometimes became less marked, *i.e.*, the jaundice was fluctuating. Under medicinal treatment, in the hospital the jaundice was lessening. On several occasions he noticed his stool to be clay coloured. There was no history of vomiting or melæna.

Personal history—Addicted to alcohol for a long time.

Physical findings—(1) Liver—1½" below costal margin; (2) Gall-bladder—not palpable; (3) Murphy's sign—positive; (4) Boa's sign—doubtful; (5) No rigidity or distension of abdomen.

Laboratory findings—Total and differential count of blood and its bio-chemistry was within normal limits (Cholesterol—100 mg. per cent). Vanden Bergh reaction—prompt direct; icteric index—35 units; coagulation time—3 minutes; bleeding time—4½ minutes.

With a provisional diagnosis of "chronic cholecystitis and stone in common duct", the case was operated upon by Dr. Subodh Datta on 19-8-42 under paraldehyde and ether.

Operation Notes—Right rectus incision; a good deal of hæmorrhage from the parietes; plenty of clear fluid from the peritoneal cavity was sucked out. Liver hobnailed. Gall-bladder—thick, white and contracted, no stones, no adhesion or evidence of surrounding inflammation. No enlarged lymph-glands were found anywhere. The common duct was of the size of the duodenum. Soft "fleshy" mass easily broken down by finger pressure was felt in the common duct. Common duct was opened. The "fleshy" mass (looked like granulation tissue—sarcomatous tissue?), blood clot and inspissated bile-mud removed by curettage. Finger palpation showed that the duct was smooth inside and no evidence of induration or localised thickening. Both hepatic ducts were distended, nearly admitting the little finger. Beginning of retroduodenal common duct was constricted—easily dilated by metal bougies. The common duct was drained and omentum grafted.

The surgeon explained that he suspected the fleshy mass to be malignant but could not perform (*a*) cholecysto-gastrostomy as the gall-bladder was diseased; (*b*) excision of the bile-duct and its transplantation was considered hazardous because of the patient's poor general condition and prolonged nature of the operation; (*c*) for the same reason intrahepatic cholangiostomy after Mitchels, was not done.

Postoperative period was uneventful. The tract of the drainage tube in common duct, took about 25 days to heal. Jaundice diminished. Icteric index came down from 35 units to 23 units, within a week of the operation.

Pathological report on pieces of tissue removed from the common bile duct—The tissue consists of whitish masses, in places deeply stained with blue. The masses appear to be portions of a carcinomatous tumour consisting of cubical epithelial cells. The cells proximal to lymph channels are well formed while those away from them show signs of degeneration. Necrotic foci are seen in places. Portions of the tumour stained with bile show marked degenerative changes, in which no cellular structure can be made out.

The tumour appears to be *primary carcinoma* of the common bile duct (*vide* Figs. I and II).

FIG. I.

Caution is necessary in the histological diagnosis of carcinoma of the bile-duct. The mucous and serous glands in the subepithelial membrana propria of the bile-ducts are surrounded by connective tissue fibres with smooth muscle bundles. This gives the appearance of epithelial cells infiltrating the muscular coat and must be distinguished from true malignancy, where there are also in some part of the tumour, aberration of the epithelial cells—irregular proliferation altered staining reaction and pyknosis with mitotic figures in the nuclei. (Cowdry).

DISCUSSION

Pain, though an inconstant symptom, with carcinoma of the bile-duct, was present in this case. Krishbaum (*loc. cit.*) says that in 26 out of 55 cases (41·9%) pain was present, but it was never colicky in nature. In this case, the pain might have been due to chronic cholecystitis as there was no infiltration of the wall of the duct. *Jaundice* was present in all cases (92%), but once established it was intermittent. Sometimes in early cases it may be transient. This may be due to œdema of the duct and might be an explanation in this case as the carcinomatous mass did not completely fill up the lumen of the duct.

FIG. II.

Ascites was a common feature in most of the recorded cases. It might be due to (*a*) carcinomatosis of the peritoneum, (*b*) obstruction of the portal vein, (*c*) cirrhosis of the liver and (*d*) pressure by intrahepatic tumour mass. We think in our case the ascites was due to cirrhosis only as was evidenced by the appearance of the liver. *Enlarged liver* is present in a fair number of cases of intra-hepatic bile duct carcinoma. *Distended gall-bladder* is present in a vast majority of cases of bile duct carcinoma. In our case due to chronic inflammatory fibrotic changes, the gall-bladder was previously contracted. *Icteric nephrosis* was present in 62 per cent of the cases (Krishbaum, *loc. cit.*). This is due to the deposition of the bile pigment in the tubular epithelium as a result of obstructive jaundice. In this condition casts stained with bile-pigment are seen. But we did not find them in our case, the urine in our case being normal except for bile salts. *Cholelithiasis.* Though denied by many, some hold that gall stone has a definite relation to carcinomas of both gall-bladder and its ducts because of (1) chronic irritation (stones possessing radio-active substances), (2) stones might possess some carcino-

genic agent. *Ulcer-cancer*—Rolleston was of opinion that carcinoma might develop on an old ulcer in this situation as in gastric carcinoma. In this case there was no chronic ulcer at the site and the duct wall was smooth. *Localising factor.* Assuming that carcinoma is due to long-continued action of some carcinogenic agent on a susceptible subject (Cramer, 1938), carcinoma of the bile-duct raises the problem as to whether there is any good ground for suspecting the action of bile with its constituent cholic acid, to be responsible for localising carcinoma in these subjects.

The case is interesting for the following reasons: The tumour was found in a comparatively younger person, age of the patient being 32 years only. The site of occurrence presents another distinctive feature. As stated, the tumour was in the upper part of the common bile duct, a rather uncommon site for carcinoma. The jaundice present in the case was of a fluctuating type and in the case was also seen the association of chronic cholecystitis, cholelithiasis and carcinoma of the common duct. The type of carcinoma most commonly found in this situation is an adenocarcinoma, which constitutes 29 per cent of cases, while the type of carcinoma that the patient had (medullary carcinoma) is distinctly rare (3 per cent).

Conclusion

Majority of hospital records of this country do not show any case of medullary carcinoma of the common duct. This is a case with many peculiar features combined in one and our limited search of the literature does not reveal a parallel case.

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SHORTER COURSE FOR LICENTIATES GOING IN FOR GRADUATION

We reproduce elsewhere in this number a resolution passed at the last meeting of the Indian Medical Council held at Delhi on 22-10-43 which will be of particular interest to our members. The Medical Council of India has resolved to modify the conditions governing Licentiates proceeding to take an M.B. degree of an Indian University. So far, rules existed allowing certain facilities but in practice these were not easy to comply with and hence the number of Licentiates actually obtaining a medical degree was very small. The last resolution of the Indian Medical Council has allowed that the Matriculation Examination will be recognised as the Preliminary qualification.

Apart from this, the irksome regulations of having to pass examinations in practically all subjects of medical studies have been removed, the only condition remaining that Anatomy, Physiology, Materia Medica, Pharmacology including Biochemistry must be studied for six months and further studies of the senior and clinical subjects must be persued for a period of 18 months. We consider that this constitutes a great advance and will facilitate a large number of our members to proceed to obtain the degree. Though this measure will only hold good during the duration of the war and three years thereafter, we hope the Indian Medical Council will have helped us in our cry to do away with the caste system in the profession by prolonging this period a little further, so that most of the Licentiates can automatically proceed to the Degree Examination. We are confident that large numbers will not fail to take advantage of these regulations—provided, of course, they can find room in the Medical Colleges to continue the shortened period of studies and more specially so as the restrictions of class examinations in the subjects are-now removed. We commend to all our members to read the resolution of the Indian Medical Council carefully as that may have far-reaching possibilities.

THE HEALTH OF INDIA

Unfortunately, the blissful influence of modern scientific medicine could not or would not do much for the mass of India, the villagers, who are the real India and we agree with Macmillan that "The majority (the Dominions) remain as they were."[1] This point has been raised in these columns more than once[2, 3, 4, 5, 6, 7, 8]. Now comes a revealing document regarding the health of India by Grant. John B. Grant, M.B., M.P.H., Director of the All-India Institute of Hygiene and Public Health, has given an account of the health of India in a pamphlet of 32 pages.[9]

"He has been an officer of the International Health Division of the Rockefeller Foundation throughout his professional life, and has been on loan to the Government of India since 1939. For seventeen years he was the professor of Public Health in the Peiping Union Medical College."[10] Now as the director of the All-India Institute of Hygiene and Public Health, Calcutta, he had the opportunity to come in contact with the problems of health in India and in this pamphlet he speaks quite frankly about the real state of affairs.

"The level of health in India is low..... The resistance of the population to disease is low. Malnutrition and nutritional diseases are omnipresent."[11] This is aptly reflected in the expectation of life of the average Indian, "which is stated to be 27 years, in contrast to an expectation of 67 years in Australia, of 63 years in England-Wales, of 63 years in Germany and of 47 years in Japan."[12] According to Ukil,[13] "If the English death rate obtained in India today, there would have been 2,766,049 fewer deaths and the expectation of life would be 60..... The sickness rate in England, entailing incapacity for work is 2% of the population" There is no such work in India. "The sickness rate among the British troops in India, however, is 12 times, while that among the Indian troops 10 times that of the death rate. If this basis of calculation is taken, the amount of sickness in the general population and the consequent economic loss due to loss of wages would be enormous." The public health achievements in India with its two hundred years of benevolent British guardianship cannot even "be considered good in comparison with results in other Asiatic countries if continued heavy smallpox and cholera are the criteria."[14] Smallpox took a toll of 16·2 persons per 100,000 population while the comparative figures for Japan, Philippines and Thailand are 0·008, 0·0 and 0·08 respectively. Was it due to lack of fund? No, "The relatively poor result in India has not been due to either lack of funds or personnel. Bengal has 3,018 vaccinators and spent Rs. 4,70,644 in 1940 specifically to control smallpox."[15] It is a story of lack of co-ordination, inefficiency and bad planning all through. Decentralisation has been tried too early with these disastrous results. But when analysed the reasons of the poor health in India goes deeper. It is "the lack of knowledge and of sympathetic imagination in the British public res-

[1] Macmillan, W. M.—Warning from the West Indies, p. 13, Penguin Books, Ltd., Middlesex, England, 1938.

[2] Editorial—*J. Indian M. A.*, **11**:74, 1941.
[3] *Idem—Ibid*, **11**:167, 1942. [4] *Idem—Ibid*, **11**:279, 1942.
[5] *Idem—Ibid*, **12**:18, 1942. [6] *Idem—Ibid*, **12**:126, 1943.
[7] *Idem—Ibid*, **12**:213, 1943. [8] *Idem—Ibid*, **12**:222, 1943.
[9] Grant J. B.—The Health of India (Oxford Pamphlets of Indian Affairs No. 12), p. 32. The Oxford University Press, Indian Branch, 1943.
[10] The Health of India, *loc. cit.*, Preface.
[11] Grant, J. B.—*Ibid*, p. 3. [12] *Idem—Ibid.*
[13] Ukil, A. C.—*Calcutta M. J.*, **38**:264,1941.
[14] Grant, J. B.—*loc. cit.*, p. 17. [15] *Idem—Ibid*, p. 18.

ponsible for imperial policy."[16] Naturally enough, none of the fundamentals on which the health of a community depends have been provided. Grant[17] has rightly pointed out that, "The health of a community depends on three factors: (1) The higher the standard of living the better the health. Machinery to assure *living standards* adequate for the maintenance of health has to be provided. (2) The higher the standard of *education* the better the health. Teaching people how to keep healthy, how to prevent disease from attacking them and how to secure early diagnosis and treatment has to be an essential part of education. (3) An organized *public health service* to prevent disease and arrange for early diagnosis and early treatment." None of these factors have been fulfilled in British India. The income of the average Indian is Rs. 65/- (£5) in contrast to £76 in England, with the result that the average Indian can hardly keep his body and soul together on cheap carbohydrate food like rice and cannot afford sufficient protective food. Lord Horder once wrote that *"The citizen,* (the victim, as I am almost inclined to call him, of all this intricate and expensive machinery) has certain basic needs without satisfying which we cannot really be said to be alive at all, certainly he cannot be 'healthy' or 'happy': enough of the right food, decent shelter, a job of work under suitable conditions, opportunity for play and access to sunshine and fresh air..... To preach health to the underfed is a hypocrisy".[18]

Education in India is also in a big mess. 88 people out of 100, cannot even spell their alphabets. Necessarily, it is a dream to preach health to the people, who have neither a place where they can shelter their heads nor any inkling how can they live in a cleaner and hygienic way. In this connection it will not be out of place if we quote a parallel from Macmillan who opined that "The wretched neglect the Negro often suffers in the 'native quarters' of European-run towns is not to be cited as evidence of his own indifference to cleanliness and order."[19] So the unhygienic homes are not necessarily the result of a hankering after filth. One of our contemporaries gives another valid reason for the poor state of the teachers and education in India. "Too low educational requirements for our teachers, too low salaries to attract reasonably qualified persons into the teaching profession—these are the difficulties....."[20] But "The teacher is not wholly to blame; the wretchedly poor school building and its grounds, and the almost complete absence of equipment are factors too."[21] These are Governmental arrangements and could be remedied.

The third factor, the public health, is still in an initial stage, and according to Grant, "Medical protection has not been yet made available to the individual villager, even to the extent possible within the present economic resources."[22]

"The present average peripheral unit is a health circle around 80,000 of population and 80 square miles". The result is obvious. This almost impossible task relegated to these units can never be properly done and is not naturally done. "The bulk of medical relief for such as 400 millions of whom more than 80 per cent live in villages, is still provided through the indigenous pre-scientific systems of medicine and their practitioners".[23] An ideal of modernisation indeed!

Let us now further examine the problem in detail. "There are approximately 42,000 doctors, of whom two-thirds are Licentiates. This total is less than Japan's for a population approximately the same as Bengal's".[24] The nursing staff is also very inadequate. "There are less than 4,500 nurses throughout the country as compared with 42,000 doctors",[25] while "there are 109,500 nurses and 61,420 doctors in Great Britain, or approximately two nurses to each practising doctors".[26] Grant said, "The example precludes further comment".[27] We do not want to add anything to his remarks.

This is the account of the health of India, given by an unbiased, qualified man who can speak with some authority on the subject. This account does neither show any modernization of India, that was started two hundred years ago or it was rather a very slow process. Not only the appalling figures speak very poorly when compared to those of European countries but also stand in sad contrast to those of other Asiatic countries.

Lack of organisation, good will and any definite scheme in India with the poor result in the health, happiness and progress makes one unhappy and he cannot but agree with Macmillan who said, "By nature and definition colonies are colonies just because they are poor and backward; to allow them to remain so reflects no credit on the colonizing power."[28]

[16] Macmillan, W. M.—*loc. cit.*, p. 14.
[17] Grant, J. B.—*loc. cit.*, p. 4.
[18] Horder—Foreward, Britain's Health, p. x, Penguin Books, Ltd., Middlesex, England, 1939.
[19] Macmillan, W. M.—*loc. cit.*, p. 113.
[20] Editorial—*J. Christian M. A., India, Burma and Ceylon*, **18**:262, 1943.
[21] *Idem—Ibid*, p. 263.
[22] Grant, J. B.—*loc. cit.*, p. 30.
[23] *Idem—Ibid*, p. 16.
[24] *Idem—Ibid*, p. 24.
[25] *Idem—Ibid*, p. 24.
[26] *Idem—Ibid*, p. 25.
[27] *Idem—Ibid*, p. 32.
[28] Macmillan W. M.—*loc. cit.*, p. 13.

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CURRENT MEDICAL LITERATURE

MEDICINE

Pulmonary Manifestations in Extrapulmonary Tuberculosis*

Taper and Jacobson (*Am. Rev. Tuberc.*, Feb., 1943) write that the chest films of 100 unselected patients with extrapulmonary tuberculosis were analysed in an attempt to determine the relative frequency and character of co-existing pulmonary tuberculosis. For the sake of comparison and in order to weigh the practical import of results more carefully, another 100 cases of adult pulmonary tuberculosis with no clinical evidence of extrapulmonary tuberculosis were reviewed. In the group of 100 patients with extrapulmonary tuberculosis, 79 showed rœntgenological evidence of postprimary pulmonary involvement. The pulmonary lesions in the majority of these 79 cases were fibrotic and calcific, apparently inactive, with proliferative, nodular and exudative manifestations decreasingly common in this order. The character of these lesions, their tendency toward bilateral, symmetrical apical and subapical distribution, seen in 44 of the 79 cases, would seem to indicate a hæmatogenous origin and emphasize the systemic nature of the disease. Rœntgenographic evidence of cavitation was seen in 15 cases. These cavities were mostly thin-walled with bilateral symmetrical distribution and, in spite of the fact that 12 of these cases had positive sputa, only one showed evidence of bronchogenic spread. In cases in which multiple films were available, stability or regression of the pulmonary lesion and the absence of bronchogenic spread were the outstanding features. Though progressive pulmonary lesions did occur, for the most part they were of hæmatogenous nature.

The following features, as determined from this study, may be listed as characterizing the pulmonary lesions associated with extrapulmonary tuberculosis: Predominance of fibrocalcific lesions, apparently inactive; bilateral, symmetrical apical and subapical distribution; cavities, when present, thin-walled and with tendency to symmetrical distribution; relative absence of bronchogenic dissemination; evidence of regression or stability in the pulmonary lesion with superimposed hæmatogenous spread a not uncommon feature.

Review of the chest films of 100 control patients admitted to the tuberculosis unit with no clinical evidence of extrapulmonary tuberculosis emphasized the acute exudative caseous nature of the usual adult pulmonary tuberculosis with its tendency to bronchogenic spread. However, a small percentage of the patients in the control group without evidence of extrapulmonary tuberculosis exhibited a pulmonary picture similar to that found in the group with known extrapulmonary foci. These few cases demonstrated bilateral, symmetrical lesions with tendency to chronic course and absence of bronchogenic spread.

The ability to recognize the chronic disseminated or hæmatogenous form of pulmonary tuberculosis, it was concluded, would seem to be of value in prognosis and treatment to both the surgeon interested in treating extrapulmonary tuberculosis and the tuberculosis specialist.

The Heart in Pulmonary Tuberculosis*

Roberts and Lisa (*Am. Rev. Tuberc.*, March, 1943) write that the communication is a report of the cardiac lesions found among 100 cases of pulmonary tuberculosis upon whom necropsies were performed at City Hospital, Welfare Island, New York. Demonstrable myocardial lesions were present in 69. They consisted of tuberculous myocarditis in 10, acute rheumatic myocarditis in 1, Aschoff body-like lesions in 9, acute interstitial myocarditis in 50 and acute miliary infarctions in 11. Combination of the lesions were found in 13. Healed rheumatic valvulitis was found in 5, sclerotic lesions of the mitral and aortic valves in 20; acute valvular endocarditis in 2 and syphilitic aortic valvulitis in 2. There were 3 instances each of tuberculous, chronic and adhesive and acute non-tuberculous pericarditis. Tuberculous myocarditis was more frequent in the adults than in children. Non-tuberculous pulmonary infections appeared to be a significant factor in the causation of the interstitial myocarditis. Miliary infarctions occurred predominantly in the hypertrophied hearts, in hearts with severe coronary arteriosclerosis and in the later decades of life. The conception of a small heart in tuberculosis was not substantiated. Right ventricular hypertrophy was very uncommon. Mensuration of the ventricular wall appeared to be an unreliable criterion for hypertrophy; the microscopical appearance of the myocardial fibres appeared more accurate. A moderate or severe disproportion between pulse rate and height of temperature was suggestive of myocardial disease. Murmurs due to organic valvular lesions were fairly common. Functional murmurs were uncommon. The conception that hypertension and active tuberculosis are incompatiable was not borne out. Electrocardiographic tracings frequently revealed significant observations. While the present series is too small to permit definite conclusions about many controversial points, it is the belief of the authors that more attention paid to the cardiovascular system in the tuberculous individual will result in a more accurate estimation of existing cardiac damage.

Effusion in Pneumothorax Treatment

Sen and others (*Indian M. Gaz.*, **78**:505, 1943) give in the following lines the summary of their observations on the incidence of pleural effusion in artificial pneumothorax in cases treated in the out-patient department of the Medical College, Calcutta.

500 cases treated with artificial pneumothorax have been studied with reference to the incidence of pleural effusion.

It has been stressed that as the duration of treatment has a definite effect on the incidence and as this duration is likely to vary from one study to another, a direct comparison on total incidence figure is not justified. For this reason, a curve showing the risk of effusion at different periods in the course of treatment has been worked out. This shows that out of 100 persons having A.P. treatment, 11 will develop effusion in the first month. Of the rest, 13 will develop effusion in the second month. Of the rest, 7 or 8 will develop effusion in the next month and so on, with the result that after 18 months' treatment only 34 will not have developed an effusion. The curve indicates that the rate is higher in the earlier months.

The influence of factors—sex, age, habitation, stage of the disease, character of disease, nature of collapse, presence or absence of adhesions and mobility of mediastinum has been

assessed, taking duration of treatment in each case. None of these factors showed any significant effect on the formation of effusion. There is only a suggestion that in childhood the rate is higher and people of rural habit show a slightly lower rate in the first month.

No relationship could be detected between the amount of effusion and the time of its commencement. The proportion of slight to moderate amount of effusion is found to be 3 to 2. The number of massive effusion is few.

Intestinal Tuberculosis

Frimodt-Moller (*Indian M. Gaz.*, **78**:505, 1943) lays great stress on the use of x-ray in the diagnosis of intestinal tuberculosis. It is a comparatively easy and simple, though time-consuming method, it is remarkably consistent, it conforms surprisingly well with the clinical picture and it yields information of much value in cases where other methods fail. The author maintains that the number of cases with intestinal involvement missed by the x-ray method cannot be many, and probably are so few as to be of academic rather than practical interest. The method is essential for any rational work on intestinal tuberculosis. Of a group of 163 patients, mostly Indians, all of whom but two had pulmonary tuberculosis, 64 showed definite radiological signs of intestinal tuberculosis. The x-ray diagnosis was based upon demonstration of typical filling defects in the ileum, cæcum and ascending colon especially. Rapid passage of the barium through the colon was found associated with the finding of filling defect, although hypermotility was found in x-ray negative cases more frequently than is reported for European patients. Of 103 unselected cases, 32 (31·1 per cent) had intestinal tuberculosis. The frequency of intestinal tuberculosis increased with the severity of the pulmonary disease but the possibility of intestinal involvement cannot be ruled out even in apparently healthy patients. The prognosis, though certainly unfavourable for cases with intestinal tuberculosis, would not be regarded too pessimistic, as many cases undoubtedly fare well despite their abdominal complication.

Congenital Syphilis: A Statistical Study with Special Regard to Sex Incidence

Wile and others (*Am. J. Syph.*, **26**:70, 1942, Ref. *Brit. J. Dermat. & Syph.*, **55**:165, 1943) write that this enquiry showed the signs and symptoms that developed in congenital syphilitics who had had little or no treatment; and also, in a few cases, those that had persisted in spite of adequate treatment.

Five hundred cases were examined. Those under the age of two years were classed as infantile; there were 98 of these. The others were termed tardive. Males formed 45 per cent of the former group, and 46 per cent of the latter. Most of the cases were in white subjects, corresponding with the colour distribution of the people in the neighbourhood.

In the infantile group there was no instance of a negative family history for syphilis. A large majority of patients had positive serological reactions, and the spinal fluids were positive in nearly half of the 19 cases tested.

It was uncommon to find the eyes and ears affected, and the nose and throat were normal in 78 per cent. 18 per cent showed snuffles, and 4 cases presented a saddle deformity.

Skin rashes were present in 27 per cent but mucous membranes were seldom involved. General glandular enlargement was noted in a third of the cases only. Hepatic and splenic enlargement was uncommon; splenomegaly occurred in 2 per cent and was combined with liver enlargement in another 3 per cent. There was no case of liver enlargement alone.

Active bone lesions were found in 5 per cent and inactive ones in 12 per cent. Bony stigmata were found in 38 per cent. There were 9 cases of neurosyphilis, a third of which were asymptomatic, a third of meningovascular type, and 2 cases suffered from convulsions associated with hydrocephalus or mental retardation.

In the tardive group there were negative family histories for syphilis in 6 per cent, serum reactions were positive in 90 per cent and 27 per cent of 343 cases gave positive spinal fluids.

The eyes showed syphilitic lesions in 59 per cent of the cases. Interstitial keratitis was the commonest lesion found. Primary optic atrophy occurred in only 3 per cent. Nerve deafness was noted in 6 per cent. Saddle deformity of the nose was encountered in 10 per cent, Hutchinson's teeth were present in 31 per cent and another 16 per cent had suggestions of the deformity. Hutchinson's triad was seen in only 9 cases. Skin lesions occurred in 8 per cent, rhagades being the commonest.

Contrary to the findings of others, arthritis was rare occurring as Clutton's joints in only 2 per cent of cases. There were 5 cases of combined liver and splenic enlargement. Bone lesions were seen in 39 per cent, three fourths of these showing the stigmata of syphilis. Active lesions were met with in 4 per cent. Neurosyphilis was commonest in males. Half of these cases were asymptomatic, though they had positive spinal fluids.

SURGERY

Duodenal Ulcer Syndrome Caused by Ankylostomiasis*

Yenikomshian and Shchadi (*Am. J. Rœntgenol.*, Jan., 1943) write that it is well known that gastrointestinal disturbances caused by hookworm disease may appear in different clinical forms, including that of duodenal ulcer. Symptoms are often vague and indefinite, the patients complaining of heartburn, flatulence, a feeling of fullness of the abdomen and irregular bowel movements. In this report from the American University, Beirut, Syria, 25 patients whose clinical history was suggestive of chronic duodenal ulcer but in whom stool examinations revealed presence of ova of ankylostoma duodenale were studied with regard to gastric acidity and rœntgenologic findings. Estimation of free gastric acidity showed a rise to a higher level in these patients than that obtained in duodenal ulcer. In spite of varying degrees of severe anæmia, such a high gastric acidity was maintained. Rœntgenologic studies of these cases showed evidence of swelling of the duodenal mucosa, inconstant deformity of the duodenal bulb (duodenitis without ulcer niche), hyperperistalsis of stomach and duodenum, and commonly, reversed peristalsis of the duodenum without obstruction. Administration of a vermifuge successfully resulted in the elimination of epigastric pain within twenty-four hours, and the restoration of the duodenal wall in from eleven to twenty-four days in these cases.

Effect of Administration of Alkali on the Human Kidney*

Kirsner and others (*Arch. Path.*, Feb., 1943) write that this investigation comprises a study of the autopsy observations

in 14 patients who had received during life large amounts of alkali and for whom adequate studies of acid-base were available. The series is composed of 4 patients (group 1) who had taken large amounts of alkali but in whom alkalosis had never occurred; 6 patients (group 2) who had experienced one or more episodes of alkalosis during alkali therapy but who did not die in alkalosis, and 4 patients (group 3) who had taken large quantities of alkali and in whom alkalosis was present at the time of death. Special histologic changes were not noted in the glomeruli of the kidneys of these 14 patients after prolonged alkali therapy with or without alkalosis. The epithelium of the collecting tubules in the kidneys of 6 patients showed degenerative and regenerative changes. There was precipitation of calcium in the lumens of these tubules. The tubules which did not contain calcium usually appeared normal. Three of these 6 patients had previously experienced alkalosis but did not die during the acid-base disturbance; alkalosis was present at the time of death in the other 3. All 6 patients had lost excessive amounts of chloride by vomiting or therapeutic aspiration. Similar changes were observed in a patient not receiving alkali but in whom severe hypochloræmia and alkalosis developed as a result of gastric aspiration.

Developmental Cataracts*

Falls (*Arch. Ophth.*, Feb., 1943) in this paper summarises the results of surgical treatment in 131 cases of developmental cataracts at the Ophthalmic Clinic of the University Hospital (University of Michigan) between the years 1925 and 1942. From this review it was concluded that persons with developmental cataracts are extremely likely to have associated ocular or constitutional congenital anomalies. These persons have poor protoplasm. It was suggested that in the case of complete bilateral cataracts, operation be performed on one eye after the patient reaches 6 months of age. The other eye may be surgically treated after the age of 2. If the cataracts are incomplete and the child can get around, surgical intervention should be postponed until the third or fourth year of life. In the present series, in very young children discission of the lens capsule proved to be the safest technic, and although complications were frequent they were fortunately minor. The best visual acuity was obtained when the combined technic of discission and linear extraction was employed. Of 233 eyes, 83 or 35·5 per cent obtained a final visual acuity of 6/12 or better and have permitted the patients to maintain a useful place in society. Contraception is urged when the cataract is familial. Sterilisation is recommended when the offspring displays a lenticular defect which is proved hereditary. Surgical intervention in early life is hazardous, as shown by the fact that a high percentage of complications and 33 per cent of the total failures (from light perception to no vision) occurred in the age group under 2 years.

Bacteriophage Therapy of Staphylococcic Septic Obstruction of the Cavernous Sinus*

MacNeal and others (*Arch. Ophth.*, March, 1943) in this paper presented the records of 45 patients with staphylococcic obstruction of the cavernous sinus treated with bacteriophage during a ten year period, 1931 to 1940. Of these patients, 31 per cent survived the infection, 51 per cent succumbed within five days and 18 per cent died after a prolonged illness. Most of the patients were included in the staphylococcæmia series previously presented, but in six instances, 4 of them fatal cases, proof of invasion of the blood stream was lacking. The recovery rate of 31 per cent in this series is not appreciably lower than that determined for the entire staphylococcæmia series of 500 patients. Rapidly progressive phlegmonous inflammation of the face extending to the eye should be promptly diagnosed as malignant staphylococcic infection and should be treated as such immediately, pending confirmation or refutation of this diagnosis by bacteriologic studies. The patient should receive staphylococcus bacteriophage intravenously in a series of regularly spaced increasing doses until a chill results or until a total amount of 500 to 1,000 c.c. has been administered on the first day. Subsequently, the bacteriophage should be injected at least twice daily until the patient appears normal and then once daily for two weeks. It should then be administered once or twice a week for six months. Too early discontinuance of bacteriophage therapy would appear to have contributed to some of the late deaths in our series. Prolonged bacteriophage therapy is earnestly recommended in cases of apparent recovery in order to prevent recrudescence of the disease and various late complications, especially intracranial abscess. Sulfathiazole should be given promptly, 8 to 12 gm. on the first day and 4 to 8 gm. daily thereafter for ten to fourteen days. Use of this drug should then be discontinued because of the risk of toxic complications. Treatment of facial furuncles by squeezing, by incision or by irradiation seems to have been responsible for malignant extension of the infection in some of the patients considered here. Conservative and gentle local care of such lesions is recommended. Surgical attack on the orbit, carotid artery, temporal bone, accessory air cavities or intracranial structures should not be undertaken without most careful consideration of the risks involved. In general the surgeon with most mature experience in this field will be most conservative.

OBSTETRICS AND GYNAECOLOGY

Simple Amenorrhea or Pregnancy? Use of Prostigmin in Differentiation and Treatment*

Douglas (*West. J. Surg.*, April, 1943) observes that prostigmin is a reliable test for pregnancy and in his hands yielded results comparable to the Friedman test. In all instances where the Friedman test was used to corroborate the prostigmin test the two were found to be in perfect accord.

In borderline endocrine cases the interpretation of the prostigmin test must be as carefully guarded as in certain Friedman tests. The advantage of prostigmin as a test for pregnancy over that of other pregnancy tests is especially noted in that in the absence of pregnancy or a glandular dysfunction it will bring about vaginal bleeding, thereby acting as a therapeutic as well as a testing agent and affording to the patient quick psychologic and physiologic relief. The test is simple, the results accurate and can be applied by the average clinician in his own office.

Vaginal Antisepsis during Labour: 11,000 Vaginal Deliveries without a Death from Puerperal Infection*

Mayes (*West. J. Surg.*, May, 1943) writes that puerperal sepsis is still the leading cause of maternal death in the United

States, and for the year 1940 accounted for 52·6 per cent of the maternal deaths in the City of New York.

This report gives in complete detail the technic of vaginal antisepsis as well as a discussion as to the choice of antiseptics. During the last 18 years the patients in the obstetrical department of the Methodist Hospital have been protected from puerperal infection by the vaginal instillations of a four per cent solution of mercurochrome during labour and at the time of delivery. The adequacy of this protection is shown by the fact that there have been 25,347 vaginal deliveries since January 1, 1928, with only two deaths from puerperal sepsis. There has been but one such death in the last 20,048 cases and not one in the last 11,000 vaginal deliveries.

The present report covers the period from January 1, 1934 to January 1, 1942, a record of 13,763 patients with a morbidity of 7·8 per cent previously unreported. If the cæsarean sections are omitted the morbidity is 5·3 per cent and the corrected morbidity 3·3 per cent. There were 528 cæsarean sections, with a morbidity of 54·0 per cent and 12 deaths, one of which was from infection. Among the vaginal deliveries there were 6,237 operative deliveries with no sepsis deaths. These include 5,341 low or prophylactic forceps, 659 midforceps, 28 high forceps and 161 Scanzoni manoeuvres. They also include 106 versions and 113 bag inductions.

There were 7,952 episiotomies with a morbidity of 5·8 per cent and one death from infection. There were 683 breech deliveries, 252 postpartum hæmorrhages and 62 placenta prævias, and 700 patients with varying degrees of toxæmia, with no deaths from sepsis. Thirty-two per cent of all the patients delivered during the last eight years were examined vaginally, and 31·8 per cent of the patients with a morbidity during the same period had vaginal examinations. The morbidity for patients examined vaginally was 8·3 per cent. Vaginal examinations would seem to be a real benefit to the patient when vaginal antiseptics are used.

During 1940, a 1 to 1000 solution of zepharin was used on 837 ward patients, with a morbidity of 8·7 per cent. The morbidity on the private service, which used mercurochrome, was 5·5 per cent. There were no septic deaths on either service. No harmful effects have been found or reported following the use of vaginal antisepsis, and it would seem that a procedure so simple, so sound in principle, should not only be accepted by those teaching obstetrics but it should be a routine recommended by maternity welfare organisations and all health departments.

Intravenous Anaesthesia in Obstetrics*

Rucker (*Virginia M. Monthly*, Jan., 1943) reports one hundred obstetrical cases in which pentothal sodium was given intravenously as the general anæsthetic agent. There were no maternal complications due to the anæsthesia. There were two fœtal deaths—one a premature infant, while the second was dead in utero on admission to the hospital. Fœtal apnœa was conspicuous by its absence. The ease of induction of anæsthesia and the smooth recovery without headache and nausea were very impressive. There was no appreciable change in pulse or in respiratory rate, though a definite change in depth of respiration was produced. Cyanosis occurred occasionally but was quickly corrected by administration of oxygen. The author has found pentothal sodium very satisfactory, and considers it a distinct adjunct to the obstetrician's method of relieving pain.

Abstracts marked with an asterisk (*) were received through courtesy of the United States Office of War Information.—Editor, *J. Indian M. A.*

(*Continued from page 69*)

The appreciation of these two types of hypoprothrombinæmia is of importance in the management of affections of the biliary tract.

Acknowledgment

The author is indebted to Professor B. N. Prasad, Ph.D., F.R.S.E. and Dr. U. P. Sinha, F.R.C.S.E., for guiding this work and to Dr. B. P. Varma for allowing hospital facilities.

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(*Continued from page 73*)

Case Report 27—This case is rather tragic. A young merchant consulted for hoarseness and discomfort in his throat. History of one miscarriage, and two living children who he thought were healthy. No history of acquired infection, heredo-infection was possible. E.N.T. specialists suggested cautery; physicians suspected tuberculosis. Examination: palate high arched, foul postnasal discharge, small nodules and infiltrations in faucial walls, suspicious leukoplakial patches on tongue; epitrochlear glands palpable, some pigmented scars on both shins; anterior and posterior cervical glands palpably enlarged. Suggested serum test to which his doctor could not get him to agree, as the patient was under a false conviction that he had no treponemal infection. Nine months later, called again to say that S.W.R. was recently done and was positive. But the faucial condition was then definitely malignant with much enlarged, adherent cervical glands. Antisyphilitic treatment gave him some relief but he died of malignant involvement of larynx and metastases.

Finally, it is an interesting fact to note that in cases of late syphilis of the cutaneous system, the nervous system often escapes.

(*To be concluded*)

NOTES AND NEWS

NEW REGULATIONS FOR THE F.R.C.S.

The Council of the Royal College of Surgeons of England has revised the regulations for the Fellowship, and the *primary* examination beginning on November, 29th next will be the last to be conducted under the present regulations.

New regulations have been approved by the Council and will become effective as from the end of 1943.

These regulations embody the following changes:—

(*i*) The *primary* examination cannot be taken by undergraduates, but will be open only to Members of the College, or to Graduates in medicine and surgery of the Universities and Medical Colleges recognised by the Council for the purpose, who are able to comply with the conditions of the regulations.

(*ii*) The subjects of the primary examination will be:—(a) *Anatomy (including Normal Histology), and* (b) *Applied Physiology and the Principles of Pathology.* A synopsis indicating the general scope and spirit of the examination in *applied physiology and the principles of pathology* is published in the new regulations.

With regard to the *final* examination, no candidate will be admissible without producing evidence of having been engaged in the acquirement of professional knowledge for not less than two years subsequent to the date of having obtained the Membership of the College or some other recognised qualification, *vide* (*i*) above.

The dates of the examinations have been re-arranged, so that it will be possible for candidates who pass the *primary* examination to proceed immediately to the *final* examination, if they are eligible. During 1944 the examinations will begin on the following dates:—

Primary examination—April 24th and October 23rd.

Final examination—May 4th and November 2nd.

Copies of the new regulations, and full particulars may be obtained, post free, from the Director of Examinations, Examination Hall, Queen Square, London, W.C. 1.

MEDICAL COUNCIL OF INDIA

The following is an extract from the Address delivered by Dr. B. C. Roy, President, Indian Medical Council, at a meeting held on 23-10-43 at New Delhi:

Under the direction of the Executive Committee arrangements have been made for the inspection of the Second as also Part I of the Final M.B., B.S. Examinations at the Agra University during this month. Part II of the Final Examination will be held for the first time in April, 1944. Inspectors for which have already been appointed by your Executive Committee.

With regard to reciprocal recognition of medical qualifications the Hyderabad Medical Council have been informed as directed by your Executive Committee that this Council would be prepared to arrange for inspection of the Courses of Instruction, facilities for teaching and examinations for the M.B., B.S. degree granted by the Osmania University as soon as they are ready for such inspection. As regards their L.M.S. qualification the Committee decided to postpone the question of its recognition till after their M.B., B.S. degree has been permanently recognised.

The Mysore Medical Council have agreed to enter into reciprocity with this Council and they are also being informed of the Executive Committee's decision for further report as a necessary preliminary to permanent recognition of the M.B., B.S. degree of the Mysore University.

With regard to your proposal for an All-India Register the opinion of the various Provincial Governments has recently been received through the Central Government and is being dealt with.

As directed by you at the last session the attention of the British Indian Universities has been drawn to the desirability of paying special attention to the teaching of Orthopædic Surgery on account of increasing importance of the subject.

In pursuance of the recommendation of your Executive Committee the Bombay University have amended their regulations to provide for separate written papers in the subjects of Forensic Medicine and Hygiene and that the candidates should secure the minimum marks prescribed for each of these subjects separately both in the written and oral, as well as, 50 per cent in aggregate.

You will remember that your Executive Committee after obtaining detailed information relating to the Basic Scientific Subjects from the various Universities formed a Board of Experts for the purpose of drawing up minimum requirements of the medical students in these subjects. The requirements so drawn up were forwarded to the Universities for their views, which on receipt were circulated to the Experts on the Board for further remarks. As directed by the Executive Committee all these papers have been forwarded to the Inter-University Board for necessary action in reference to the resolution with regard to bringing about uniformity in the content of the Pre-medical course in the various British Indian Universities

The Central Government had forwarded to this Council a copy of the resolution regarding the teaching and inclusion of Leprosy in the medical curriculum. On my direction a copy of the resolution was forwarded to all the British Indian Universities included on the First Schedule to the Indian Medical Council Act, 1933, enquiring as to the arrangements which existed in the affiliated colleges regarding the teaching of Leprosy. They were also requested for their views on the points raised in the resolution and the report. The replies received were placed before your Executive Committee and as directed it was suggested to the Universities that special instructions in diagnosis and treatment of Leprosy on modern lines be provided for the students of the medical colleges. The Universities' replies in this connection are receiving the consideration of the Executive Committee.

Consequent upon the withdrawal of reciprocity through the General Medical Council the South African Medical qualifications are recognised by this Council when granted on or before the 31st March, 1942. Communications have now been received from the Central Government and the South

African Medical Council from which it appears that the said Council desires to establish direct reciprocity with your Council. The terms of such reciprocity are receiving the attention of your Executive Committee.

* * * *

Colonel Hance was elected to the Executive Committee, *vice* General Sir Gordon Jolly, resigned.

* * * *

Re. Facilities for admission of the holders of L.S.M.F. or similar diplomas to the M.B., B.S. degree during the war, the Council adopted the recommendation of the Executive Commitee in the following amended form:—

"The Executive Committee recommends to the Council that during the period of war and for three years thereafter, the resolution of the Council dated the 25/26th August, 1937, regarding the admission to any M.B., B.S. degree mentioned in Schedule I of the Act, of the holders of any license or diploma granted by an Examining Body in British India registrable under any of the Provincial Medical Council Acts, be modified as follows, namely—

(*a*) the Cambridge School Certificate Examination, the Matriculation Examination or an examination equivalent thereto will be recognised as meeting the Council's requirements as per recommendation I (*ii*) (*e*) provided that the certificate includes a pass at one and the same examination in the following subjects:—

(*i*) English (Language or Literature),
(*ii*) Mathematics (Elementary or additional),
(*iii*) a language other than English,
(*iv*) any other subject (except Religious knowledge) from Groups I, II and III.

Provided also that in the case of those who have held commissions as Medical Officers in His Majesty's Indian Land Forces, recommendation I (*ii*) regarding the preliminary qualifications may be waived altogether if the preliminary examination in General Education passed by them before commencing the study of Medicine for the acquisition of the qualifications entitling them to registration with the Provincial Medical Councils, included an examination in Mathematics (Arithmetic, Algebra and Geometry), if he applies for the facility within three years after demobilisation.

(*b*) That such a practitioner produces a certificate from the Principal of having attended for a period of six months a course of instruction in Anatomy, Physiology, Materia Medica, Pharmacology including Biochemistry, at a medical institution which gives instruction in these subjects for obtaining a qualification mentioned in the First Schedule.

(*c*) That he produces further a certificate of having attended a course of study in Pathology, Bacteriology, Forensic Medicine, Hygiene and Public Health, Medicine, Surgery including Ophthalmology, Midwifery, Diseases of Women and Infant Hygiene.

Provided that during this period of 24 months or 2 academic years such medical practitioners shall have spent not less than 12 months or one academic year in clinical studies.

Provided further that the holders of any diploma such as Madras D.M.S. which involves medical studies for 5 years may omit the study of Anatomy, etc., as contemplated under (*b*) above, and that in their cases the total period of study would be 18 months as contemplated in (*c*) above.

(*d*) That such a practitioner will on production of the above certificates be permitted to appear for the Final M.B., B.S. Examination of any university recognised by the Medical Council of India, in the following subjects:—

Pathology, Bacteriology, Hygiene and Public Health, Medical Jurisprudence, Medicine including Therapeutics, Surgery including Ophthalmology, Midwifery and Diseases of Women including Infant Hygiene."

Further resolved: "That the resolution as adopted by the Council be forwarded to the various British India Universities included on the First Schedule in order to give effect to the recommendations contained therein."

DR. K. S. RAY GOLD MEDAL FOR PAPER ON PUERPERAL SEPSIS

The following notification regarding last date of receipt of articles and records of original work for Dr. K. S. Ray Gold Medal was published in the press throughout the country in November, 1943. It is being reproduced for the information of members of the Association and the readers of the Journal:—

> "The Hony. General Secretary, Indian Medical Association announces for information of the medical profession that the last date for receipt of papers on Puerperal Sepsis containing a record of original work and investigation on the subject for which a gold medal will be awarded by Dr. K. S. Ray, an ex-President of the Indian Medical Association, to the best worker at the next Session of the All-India Medical Conference to be held at Ahmedabad during the ensuing Christmas holidays will be the 30th November, 1943. Research workers and investigators who intend to submit a record of their work on this subject are requested to send six typed copies of their articles to the Hony. General Secretary, Indian Medical Association, 12, Hindusthan Buildings, Calcutta, so as to reach the latter by the 30th November 1943."

AN ERROR

In the article on Wartime Medicine by K. Mitra published in this Journal last month (November 1943 issue, page 49) *instead* of anachronism in the first line, *please read* anomaly.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors—EDITOR

EFFECTS OF MALNUTRITION—CAUSE OF DEATH—NEED FOR MORE KNOWLEDGE

The Editor, *Journal of the I. M. A.*, Calcutta.

Sir,—In the report of the meeting of the Central Board of Health (*Hindu*, 7-10-43) there are many subjects and aspects in which the medical profession and educated public may feel much interested. One item is urgent and may help to save many lives. It is heartening to learn that a grant of Rs. 12000 is to be given to the All-India Institute of Hygiene to organise clinical research into the best methods of treating those who are admitted into hospitals dangerously ill and often in a state of collapse. Is it not tragic that the same spirit of enquiry has to be awakened now? And Calcutta had no dearth of talent or facilities for research.

On the other hand, writing in *Nature* (19-6-43, pp. 698-99) under the caption *"Relation of Hypopituitarism and Starvation"* Erwin P. Vollmer, Dept. of Biology, Brooklyn, N. Y., refers to the appalling dimensions of malnutrition in the world today and estimates that there are about 400 million people suffering from malnutrition. He pointedly draws attention to the fact that after prolonged seige in the last war, it took the survivors 1½ to 2 years to regain their body weight and their ability to eat normal amounts of food. He adds "The great depth and the persistence of the effect of chronic malnutrition can be understood only in the light of some recently acquired knowledge of endocrines." Sir Patrick Hehir observed that during a seige, emaciated but otherwise unharmed soldiers were found dead in in their bunks. It is likely they died of *hypopituitary cachexia*.

That malnutrition affects *endocrines* is wellknown. Chronic inanition leads to endocrine atrophy. Recently, it has been shown that the effects of inanition are due to malnutrition of hypophysis. "If this interpretation is correct, then millions of people are not only suffering from malnutrition but also from hypopituitarism of varying degree and kind. Treatment of these people with hormone, supplementary to adequate diet may well result in more rapid and complete recovery. Hormone treatment may be especially important for children not only to save their lives but also to prevent stunting and dystrophic growth" One is warned not to limit the treatment to any particular hormone.

Vollmer finally stresses the great need for knowledge—more knowledge, on the long term effects of malnutrition and of the period of recovery from inanition. Animal experiments in research institutes confirmed by cautious therapy in undernourished human beings under the supervision of competent physicians may throw further light on the problem. Post-mortem examinations and the examination of post-mortem records and specimens may also yield useful clues and results.

I have not seen this information in any medical journal. I do not know whether the same information has been available to any medical man, likely to look after cases of starvation and emaciation of an advanced degree. Even if this knowledge helps to treat cases and save a few lives, my labour of broadcasting this information would be amply rewarded.

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OBITUARY

DR. VISHWANATH B. PATIL

Death occurred at the age of 63 of Dr. Vishwanath B. Patil of Karachi. In his demise Karachi lost an eminent citizen and the Maharashtrian community a leader whose place it would be hard to fill.

Dr. Patil worked as a compounder before he joined the B. J. Medical School at Hyderabad. After passing his S.A.S. examination he served in the Karachi Civil Hospital for five years, after which he started his career as a private medical practitioner.

By virtue of perseverance, amiable disposition and sympathetic nature he soon built up a lucrative practice. His popularity among all sections of the cosmopolitan city was evident from the fact of his having been elected to the Municipal Corporation for nine years in succession from a general constituency. Dr. Patil, a devotee of art and literature, was well-versed in Indian music and widely read in modern Marathi and English literature. He was an ideal friend, a great benefactor and a gentleman with catholic ideas.

The following resolution of condolence was passed by the Karachi Medical Association on the 21st October, 1943:

"The Karachi Medical Association (Sind Provincial Branch, I.M.A.) records with deep sense of sorrow the sad demise of Dr. Viswanath B. Patil, from pneumonia at 12-5 A.M. on the 20th October, 1943, at the age of 63 years. Dr. Vishwanath was one of the founder-members of the Association and one of the oldest practitioners in the city. In him, the Association has lost a very valuable member, the profession one of the oldest practitioners in the city and the public a most sympathetic and calm healer of their ailments.

"The Asociation conveys its condolences and sympathies to Mrs. Patil and her family in their sad bereavement to bear the loss with fortitude and courage. May his soul rest in peace!"